Usenet Newsgroup Archive: rec.radio.amateur.space

1994

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Date span: 1994-01-01 through 1994-12-31

Source text: rec.radio.amateur.space.txt

Source item: https://archive.org/details/usenet-rec

Messages included in this PDF: 2,246

Message records with no readable body available in the source text: 15

Messages are presented chronologically by archived date.

Binary or encoded payloads are not printed as blocks of encoded text; a placeholder appears where such material was detected. The original source text is unchanged.

1. TrakBox panel layout gif file

Newsgroup: rec.radio.amateur.space
Date: 1994-01-01 01:23:26 UTC
From: fmitch@netcom.com
Message-ID: <fmitchCIxFv2.9z8@netcom.com>
Source record: 28405

hi, mitch, wa4osr here in mobile, al...

i am building the tapr/jamsat trakbox from the tapr kit... i have
laid out a front panel for it with the help of raymond, w4ujz...
the layout, front and back, was done using corel draw... i have
the files available if anyone wants to look at them... and i also
made a gif of the layout that i can ftp to anyone wanting to look
at it... the layout is really spiffy, with the tapr and the jamsat
logos, and a place for your callsign... raymond has developed a
technique for transfering the image to a panel, which we will
be publicizing soon...

for a copy of the files email me...

mitch, wa4osr

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fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR in Mobile, Alabama USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..
---

2. ANS Bulletin 001.02

Newsgroup: rec.radio.amateur.space
Date: 1994-01-01 23:38:22 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-001.02.1994@ampr.org>
Source record: 28406
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB ALL @ AMSAT $ANS-001.02
HR AMSAT NEWS SERVICE BULLETIN 001.02 FROM AMSAT HQ
SILVER SPRING, MD January 1, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-001.02

RV3DR, QSL manager for MIR contacts, advises that on December 24,
1993, December 31, 1993 and January 6, 1994 the MIR space station
will be transmitting special digitized voice messages on its
normal frequency of 145.55 MHz. The message repeats every tow
minutes. Sergey says that the developer of this equipment is
DL2MDE.

ANS thanks RV3DR for the information that went into this bulletin
and James Mollica N2NRD for relaying it to us.

/EX
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3. ANS Bulletin 001.01

Newsgroup: rec.radio.amateur.space
Date: 1994-01-02 21:02:34 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-001.01.1994@ampr.org>
Source record: 28407
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB AMSAT @ WW $ANS-001.01
HR AMSAT NEWS SERVICE BULLETIN 001.01 FROM AMSAT HQ
SILVER SPRING, MD January 1, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-001.01

A number of messages have recently been posted to the AMSAT BBS concerning the schedules for the various satellites and how they are arrived at. In the case of OSCAR-13, the schedule is determined by the AO-13 Command Team consisting of James Miller G3RUH, Peter Guelzow DB2OS and Graham Ratcliff VK5AGR. As to how these volunteers determine the schedule, a very fine set of comments was posted by Paul Beckmann WA0RSE Internet address wa0rse@amsat.org. The AMSAT News Service thanks Paul for his well-put comments and has taken the liberty of extracting them for this bulletin.

Paul begins by asking himself: What determines the mode schedule for a satellite? He says thae he found an answer in the very clearly written piece in the 1993 Space Symposium Proceedings by, you guessed it, James, G3RUH.

In his attempt to put the article by James in terms that may not be obvious to new to satellites as well as many not so new "bird-watchers", Paul offers a list of some of the important considerations:

1. All modern satellites are battery-powered with solar cell recharging systems. In order to work, the batteries must stay charged.

2. Most satellites do not have solar cells covering their entire surface. This means the attitude of the satellite with relation to the sun must be managed to keep the batteries charged.

3. The antennas are fixed to the satellite, not steerable, and necessarily "go along for the ride" when accomplishing Item 2.)

4. Each mode involves a receiver, a transmitter, and a pair of antennas. The receivers vary in sensitivity, the transmitters in power, and the antennas in gain and beamwidth.

5. Because of Item 3, the characteristics of item 4 allow transponder operation only in particular modes, when the distances and spacecraft attitudes are within certain limits. For example, a narrowbeam antenna pointing away from the Earth will not support

communications. If a particular mode requires the use of that antenna, it would not do any good to place the satellite in that mode, no matter how badly it was desired. To change the attitude of the spacecraft to point the antenna at the Earth could very well compromise solar cell illumination, hence battery charge, hence spacecraft operation - and possibly even its life expectancy.

6. Because some modes draw more power than others, the battery power must be budgeted. This also constrains how long the satellite can operate in any particular mode.

Paul admits to possibly missing some other major points, but he believes that these demonstrate to him, at least, that the mode schedule on AO-13, or any other bird, is not a self-serving decision made by some "elite superclass" who treat the bird as a "toy", but are considered decisions, constrained by the physics of the orbit, solar cells, batteries, equipment aboard, antennas, etc., designed to offer the best long-term schedule of transponder operation and to further the state-of-the-art for the next birds' designs.

WA0RSE strongly suggests reading the article by James in the Proceedings. He says that he was amazed at the number of specialized programs that had been written, complete with graphical output, to aid in the decision-making process to keep the AO-13 satellite operational. He expressed his opinion that James, and others like him, should be thanked for bringing clear explanations like these to the rest of us and for fostering experimentation in modes that have proven to provide better two-way satellite communications for our fellow hams across the globe.

Paul sums up his message by saying that we need everyone interested in AMSAT, with their opinions, tempers, passions, talents, and good humor. He also wishes all a Happy New Year. Peace on Earth. Good will toward all.

Information on ordering a copy of the Space Symposium Proceedings, which contains James Miller's article can be found on page 12 of the Nov/Dec AMSAT Journal.

/EX

4. TrakBox panel layout

Newsgroup: rec.radio.amateur.space
Date: 1994-01-03 04:51:53 UTC
From: fmitch@netcom.com
Message-ID: <fmitchCJ1EuI.I6E@netcom.com>
Source record: 28408

this is a generic reply to all email in response to my trakbox panel
layout post to the usenet and i am also posting this msg on compuserve...

the panel layout is enclosure specific for the Bud LB-1663 Contempo
box... this box is a 'ten-tec' type box, gray in color with black plastic
side panels, with the following dimensions:

3 1/4" high
7 1/32" wide
7 3/16" deep

the box is a mite too small for the pcb to fit into the pcb grooves molded in
the plastic side panels, therefore you have to *trim* the printed circuit
board by about 3/16 ths of an inch... this is easily done with a hand file...
it is *much* easier to do if you haven't populated the board... if you
don't want to trim your pcb you can still use the layout as an
example of "how to do it"...

the current layout is for the switches furnished with the first batch of kits...
the second batch of kits is currently being 'kitted'... the satellite
selector switch for the second batch of kits will be a thumbwheel type...
i am being loaned one of the new type switches and will modify the panel
layout to accomodate either switch...

i will be posting the corel draw file and also a gif file to compuserve as soon
as we have the layout modified for the new type selector switch... (if anyone
needs a different file type please let me know... i can furnish any file type
supported as an export file from corel draw 3) ... look for
a filed named tboxpanl.zip or something similar... a warning on the
gif file --- it looses much detail, and is only useful for you to grab a
quick peek at the layout...

i am looking for a ftp site to upload the files for internet access, any
suggestions for a public accessable location will be appreciated...

if you need the files directly, you can download the zip file from
my data line, see below, or send me a blank, *formatted* disk of any
flavor, along with return postage... i will dump the files on your disk and
mail them back to you...

thanks,
mitch, wa4osr
usnail: felton mitchell, 11 midtown park, e., mobile, al 36606 usa
packet: WA4OSR@W4IAX.#MOBAL.AL.USA.NA
internet: fmitch@netcom.com
landline: 205-342-7259 home, 205-476-4100 work, 205-476-0465 fax
205-342-4073 data

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fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR in Mobile, Alabama USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..
---

5. Re: Post your Sat-Track software pick here

Newsgroup: rec.radio.amateur.space
Date: 1994-01-03 13:22:45 UTC
From: rstackho@dw3f.ess.harris.com
Message-ID: <1994Jan3.132245.12058@mlb.semi.harris.com>
Source record: 28409

In article <1993Dec31.220744.11155@mnemosyne.cs.du.edu>,
bwatson@nyx10.cs.du.edu (bruce watson) writes:

|>My favorite is Quicksat written by Mike McCants. It gives you
|>a choice of parameters for visual or radio observation.

If you have an Amiga, SatTrack V3.0 a choice.

It can be found on wuarchive at /systems/amiga/aminet/misc/misc

6. ARLK055 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-01-03 14:33:45 UTC
From: lhurder@arrl.org
Message-ID: <$arlk055.1994@ampr.ab.ca>
Source record: 28410
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK055
ARLK055 Keplerian data

ZCZC SK67
QST de W1AW
Keplerian Bulletin 55 ARLK055
From ARRL Headquarters
Newington, CT January 1, 1994
To all radio amateurs

SB KEP ARL ARLK055
ARLK055 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 93361.19983217 0.00000009 10000-3 0 2145
2 14129 27.1217 349.5143 6014493 141.2894 216.7383 2.06477387 51273
RS-10/11
1 18129U 87054 A 93362.24286562 0.00000047 35308-4 0 8412
2 18129 82.9283 95.2053 0012703 133.8292 226.3913 13.72328759326464
UO-11
1 14781U 84021 B 93362.07707859 0.00000213 44030-4 0 6438
2 14781 97.7938 19.7461 0012661 94.0796 266.1858 14.69108205525188
RS-12/13
1 21089U 91007 A 93362.84080438 0.00000036 22759-4 0 6438
2 21089 82.9219 137.7780 0028333 221.5044 138.3962 13.74032271145252
AO-13
1 19216U 88051 B 93358.73417009 -.00000359 10000-4 0 8519
2 19216 57.9609 277.2102 7211124 331.1032 3.3836 2.09723023 10854
UO-14
1 20437U 90005 B 93362.19825192 0.00000046 34841-4 0 9421
2 20437 98.6028 84.2277 0011292 337.6205 22.4483 14.29812711205154
AO-16
1 20439U 90005 D 93362.19044136 0.00000021 25387-4 0 7431
2 20439 98.6109 85.2804 0011413 338.4753 21.5948 14.29868863205161
DO-17
1 20440U 90005 E 93362.72112281 0.00000022 25520-4 0 7439
2 20440 98.6115 86.0734 0011486 336.0862 23.9786 14.30006589205253
```

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WO-18
1 20441U 90005 F 93362.27369208 0.00000029 28118-4 0 7447
2 20441 98.6107 85.6427 0012153 337.9287 22.1370 14.29983727205191
LO-19
1 20442U 90005 G 93362.19321976 0.00000022 25674-4 0 7424
2 20442 98.6119 85.7807 0012433 337.6335 22.4304 14.30076764205196
FO-20
1 20480U 90013 C 93364.10373196 -.00000018 32924-4 0 6408
2 20480 99.0174 183.0203 0541189 2.6742 357.7056 12.83223163182445
AO-21
1 21087U 91006 A 93363.78995260 0.00000094 82657-4 0 4016
2 21087 82.9450 268.0636 0034363 194.3521 165.6661 13.74530789146316
UO-22
1 21575U 91050 B 93362.39229816 0.00000047 30411-4 0 4435
2 21575 98.4537 75.2021 0008751 77.8526 282.3610 14.36876541128559
KO-23
1 22077U 92052 B 93362.88719632 -.00000037 10000-3 0 3395
2 22077 66.0871 276.5452 0007562 329.2575 30.7992 12.86282651 64889
Arsene
1 22654U 93031 B 93361.28113215 -.00000051 10000-3 0 2117
2 22654 1.4185 112.4561 2935300 163.8590 194.2493 1.42195961 3311
KO-25
1 22827U 93061 E 93362.63162629 0.00000094 55871-4 0 3040
2 22827 98.6666 75.0132 0009901 342.3392 17.7430 14.27803105 13352
IO-26
1 22826U 93061 D 93362.70832665 0.00000012 22595-4 0 2429
2 22826 98.6726 75.1103 0009492 353.4556 6.6499 14.27700094 13363
AO-27
1 22825U 93061 C 93362.71502970 0.00000018 25222-4 0 2417
2 22825 98.6728 75.1048 0008935 352.3570 7.7472 14.27597768 13362
PO-28
1 22829U 93061 G 93362.61920446 0.00000038 33117-4 0 2348
2 22829 98.6675 75.0256 0010212 340.0264 20.0536 14.27992747 13356
Mir
1 16609U 86017 A 93364.19950354 0.00010973 14240-3 0 663
2 16609 51.6194 314.7124 0005815 145.1002 215.0377 15.59385717449681

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
January 4, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
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7. * SpaceNews 03-Jan-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-01-03 21:03:20 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0103.1994@ampr.org>
Source record: 28269
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0103
* SpaceNews 03-Jan-94 *

BID: $SPC0103

=========
SpaceNews
=========

MONDAY JANUARY 3, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* SUPERPRESSURE BALLOON LAUNCH *
================================
A cooperative group from Utah State University, Logan, Utah, members of the Amateur Radio community, and Winzen International plan to launch SuperBall 1-94 at approximately 10:00 A.M. MST (17:00 UTC) on January 5, 1994 from the Logan Municipal Airport. The nylon superpressure balloon for this flight is 76 feet in diameter and was manufactured and donated by Winzen International of San Antonio, Texas. The expected daytime float altitude of this helium filled balloon will be 120,000 ft (36,660 meters), with some loss of altitude expected at night. Superpressure technology is capable of maintaining a payload at such an altitude for long periods of time, potentially years.

The initial track of SuperBall will depend on upper air conditions at the time of launch, but is expected to be in the semicircle east from Utah. Possible scenarios might then take it over the Atlantic Ocean or into the polar regions within a few days.

The payload will be limited to a gross weight of 4 kilograms, or 8.8 pounds. It will consist of the following subsystems:

1) An instrument package containing a five channel Magellan GPS receiver, an external air temperature sensor, an internal payload temperature sensor, a battery voltage sensor, and a differential pressure gauge.

2) A 1/2-watt VHF MCW beacon operating on 145.871 MHz with the callsign N7YTK. Every minute it will transmit data from instruments listed above. (This transmitter will also operate through the Russian RS-10 Amateur satellite, which has a downlink frequency of 29.371 MHz, plus or minus Doppler.)

3) A one-watt CW 15-meter beacon operating on 21.229 MHz with a call sign of WB8ELK. Every five minutes it will transmit data identical to that sent on the 145.871 MHz beacon. (This signal will also be relayed through the Russian RS-12 Amateur satellite, which has a downlink frequency of 29.429 MHz, plus or minus Doppler.)

4) An ATV system consisting of a black-and-white CCD camera and associated one-watt transmitter operating on 434.00 MHz in continuous bursts on command.

5) A cutdown package containing a VHF command receiver, DTMF decoder and barometric switch, and

6) Several Lithium battery packs.

Depending on weight availability, two additional beacons are possible:

7) A one-watt VHF AFSK beacon transmitting ASCII data at 1200 baud on 145.968 MHz every two minutes in alteration with the beacon in (2) above, with the call sign of WB8ELK (also operating through the Japanese FO-20 satellite, which has a downlink frequency of 435.832 MHz), and

8) A 60-milliwatt 10-meter CW beacon operating on 28.322 MHz every minute, with a call sign of WB8ELK, transmitting pressure altitude, internal temperature, external temperature and battery voltage. Item (8) will contain either a 9-volt lithium pack that should last a month, or a 9-volt, 150 ma solar panel, lasting indefinitely.

The purpose of the SuperBall 1-94 mission is to certify this superpressure balloon technology for long-duration flight and to test the ability to control and receive data from a high-altitude research balloon for an extended period of time.

The first plateau of success will be achieved if it is possible to operate through a complete sunset/sunrise cycle at a constant pressure altitude. The second plateau will be a flight lasting a week. The third plateau will be a complete circumnavigation of the globe. Anything after that is gravy.

The float path of the balloon is very difficult to predict since the polar breakout that usually occurs this time of year frequently results in strong north-south currents. Observers from the Jet Propulsion Laboratory, Martin Marietta and Utah State University's Space Dynamics Laboratory will be present at the launch. These people are potential users of the superpressure balloon for a future Martian mission.

An HF net will be conducted by John Luker, WB7QBC, (Internet: WB7QBC@uugate.aim.utah.edu) on the day of the launch and subsequent days on 7230 KHz +/- QRM. This net will alert interested hams downrange of the balloon's path, and coordinate the collection of telemetry. The Utah Balloon Team would appreciate the forwarding of any telemetry copied to John's address along with pertinent information, including the receiving station's location, UTC date and time, signal report, and receiving equipment. Video tapes of any received ATV transmissions from the balloon would also be appreciated. The camera is only expected to be turned on during the first two days of the mission.

Questions should be directed to Bruce Bergen, KI7OM, via his Internet address: KI7OM@uugate.aim.utah.edu.

[Info via N2NRD]

* FO-20 OPERATION SCHEDULE *
============================
The following is the current operating schedule for FO-20:

ANALOG MODE:

15-Dec-93 7:41 -to- 22-Dec-93 8:05 UTC
29-Dec-93 8:30 -to- 05-Jan-94 8:50 UTC
12-Jan-94 7:30 -to- 19-Jan-94 7:50 UTC
26-Jan-94 8:20 -to- 02-Feb-94 6:50 UTC
09-Feb-94 7:15 -to- 16-Feb-94 7:40 UTC

The digital (Mode JD) transponder is available at all other times.

[Info via Kazu Sakamoto, JJ1WTK]

* NASA SELECT TV IS MOVING! *
============================
The satellite feed for NASA Select Television will be moving soon. To obtain details on the new location for NASA Select, please contact Patsy Respess at (202) 358-1701. The reason for this contact is that NASA is trying to determine how NASA Select material is being used and by whom. If you are a NASA Select user, please call NASA and let them know.

[Info via Mark Perew]

* THANKS! *
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Thanks to all those who sent messages of appreciation regarding SpaceNews, especially:

KA3UIU VE3WPB VK6KI G7DLI K7YHA

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

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John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

8. Re: TrakBox panel layout

Newsgroup: rec.radio.amateur.space
Date: 1994-01-04 00:50:24 UTC
From: fmitch@netcom.com
Message-ID: <fmitchCJ2yC2.79C@netcom.com>
Source record: 28261

Felton Mitchell (fmitch@netcom.com) wrote:

: my data line, see below, or send me a blank, *formatted* disk of any
: flavor, along with return postage... i will dump the files on your disk and
: mail them back to you...

: thanks,
: mitch, wa4osr
: usnail: felton mitchell, 11 midtown park, e., mobile, al 36606 usa
: packet: WA4OSR@W4IAX.#MOBAL.AL.USA.NA
: internet: fmitch@netcom.com
: landline: 205-342-7259 home, 205-476-4100 work, 205-476-0465 fax
: 205-342-4073 data

hey... the data line telephone number above is wrong!!! the corect number is:
205-344-4073

of course, i dial my data number all the time so it is easy to remember... hi

mitch
--
---
fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR in Mobile, Alabama USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..
---

9. tle files 255 to 300

Newsgroup: rec.radio.amateur.space
Date: 1994-01-04 03:22:36 UTC
From: eeljs@ee.mu.OZ.AU
Message-ID: <eeljs.757653756@mullian.ee.Mu.OZ.AU>
Source record: 28262

Hi

For erresearch purposes I require old files of the
NORAD orbital parameters, files tle.255 to tle.300.
Could someone help me with locating these files or if they have copies
of them I would appreciate it if I could get access to them.

Thank you in advance.

Len Sciacca
Department of Electrical and Electronic Engineering
University of melbourne
Melbourne
Australia

email: eeljs@mullian.ee.mu.oz.au

==========

10. Re: Post your Sat-Track software pick here

Newsgroup: rec.radio.amateur.space
Date: 1994-01-04 03:36:46 UTC
From: st88ssh5@dunx1.ocs.drexel.edu
Message-ID: <CJ361A.MLJ@Dunx1.OCS.Drexel.Edu>
Source record: 28263

I noticed that no one has mentioned TrakSat ver 2.8 for DOS.
I perfer this one because of the nice docs that come with the zipped
package, its very easy to use, and has a few different output formats,
this allows me to chose the style of output I want for that session
and not have to learn a new piece of software if I want a graphic style
output instead of my usual character based analytical solution.
All that time spent editing control files was also becoming a tedious
chore. IMHO

Peter

11. Direct Bcdst TV Sat

Newsgroup: rec.radio.amateur.space
Date: 1994-01-04 14:45:33 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <2gbved$ch3@charm.magnus.acs.ohio-state.edu>
Source record: 28264

I know this isn't an OSCAR satellite question but
I have not been able to find information elsewhere.

I wondered about the status of the GM/Hughes
direct broadcast TV satellite which was supposed
to be launched in December.

What is the latest launch date?
Where is it to be launched from? Kennedy?

Thanks.

Ron w8gus.

12. Re: Post your Sat-Track software pick here

Newsgroup: rec.radio.amateur.space
Date: 1994-01-04 16:45:45 UTC
From: wy1z@netcom.com
Message-ID: <wy1zCJ46K9.Ep1@netcom.com>
Source record: 28265

In article <CJ361A.MLJ@Dunx1.OCS.Drexel.Edu> st88ssh5@dunx1.ocs.drexel.edu (Peter Wisner) writes:
>
>I noticed that no one has mentioned TrakSat ver 2.8 for DOS.
>I perfer this one because of the nice docs that come with the zipped
>package, its very easy to use, and has a few different output formats,
>this allows me to chose the style of output I want for that session
>and not have to learn a new piece of software if I want a graphic style
>output instead of my usual character based analytical solution.
>All that time spent editing control files was also becoming a tedious
>chore. IMHO
>
>
>Peter

Where can I find this program? What FTP site?

Thanks.

Scott

--
```
================================================================================
| Scott Ehrlich Internet: wy1z@neu.edu BITNET: wy1z@NUHUB |
| Amateur Radio: wy1z AX.25: wy1z@k1ugm.ma.usa.na |
|------------------------------------------------------------------------------|
| Maintainer of the Boston Amateur Radio Club hamradio FTP area on |
| the World - world.std.com pub/hamradio |
================================================================================
```

13. Advice sought on sat gear: 2510/ft480?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-05 00:49:11 UTC
From: white@csusys.ctstateu.edu
Message-ID: <1994Jan4.194911.1@csusys.ctstateu.edu>
Source record: 28266
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

I'm getting ready to work the Oscars, and I have a
couple of options for outfitting my station. I currently
have an HF receiver, and my only amateur rig is a TH78A HT.
I have a chance to pick up a Yaesu FT480R 2m all-mode and/or
a Ten-Tec 2510 (mode B rig). I'm looking for some help on
the decision-making process. The Yaesu would be nice for
2m DXing; however, I don't own an HF transmitter to couple
to a transverter. The 2510 would get me working the sats
a lot quicker, but it is strictly mode B. Hey. I'm stumped.
Help?
73
Harry N1QVE white@csusys.ctstateu.edu

14. ans001.03 Experimenter's Day Returns to AO-16

Newsgroup: rec.radio.amateur.space
Date: 1994-01-05 03:09:52 UTC
From: 70774.641@compuserve.com
Message-ID: <$ans-001.03.1994@ampr.org>
Source record: 28267
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB AMSAT @ WW $ANS-001.03
ANS001.03 Experimenter's Day Returns to AO-16
HR AMSAT NEWS SERVICE BULLETIN 001.03 FROM AMSAT HQ
SILVER SPRING,MD January 1, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-001.03

Experimenter's Day Returns to AO-16

AO-16 Command Team Leader, Russ Platt, WJ9F, announces the resumption of Experimenter's Day on Pacsat. In the past Experimenter's Days on Pacsat the procedure was to change to the Pacsat Raised Cosine PSK transmitter on 437.050 Mhz and activate the S-Band transmitter on 2400.143 Mhz. With the decline of the carrier suppression on the "Straight" PSK transmitter (437.025 Mhz) the RC PSK transmitter has become the primary downlink for some time. In the upcoming schedule of Experimenter's Days the power output will be reduced on the RC PSK transmitter and the S-Band transmitter will be turned on. The power output from the S-Band transmitter is not variable so power management is controlled by varying the output of the RC PSK transmitter.

Experimenter's Days managed by AMSAT-NA have been held on UTC Wednesdays since the days of AMSAT-OSCARS 6 and 7 when Wednesday was " battery recharge day." (Incidentally, this is also the reason that the continental U.S. 75 meter nets were originally scheduled for Tuesday evenings.)

Future Experimenter's Days are scheduled for:

05 January 0411 UTC through 06 January 0340 UTC
26 January 0400 UTC through 27 January 0330 UTC

/EX

15. ans001.04 Recommended Operation Procedure to Reduce AO-16 Uplink Contention

Newsgroup: rec.radio.amateur.space
Date: 1994-01-05 03:11:41 UTC
From: 70774.641@compuserve.com
Message-ID: <$ans-001.04.1994@ampr.org>
Source record: 28268
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB AMSAT @ WW $ANS-001.04
ans001.04 Recommended Operation Procedure to Reduce AO-16 Uplink Contention
HR AMSAT NEWS SERVICE BULLETIN 001.04 FROM AMSAT HQ
SILVER SPRING, MD January 1, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-001.04

Recommended Operation Procedure to Reduce AO-16 Uplink Contention

1993 has brought many new satellites and many new satellite users. I feel
it would be good to dust off an old bulletin from 1991 to help refresh
the "old-timers" procedures and to aquaint new users to the recommended
uplink frequency usage.
The AO-16 Command Team recommends that users of the AO-16 PBBS system
use only uplink channel D (145.960 Mhz) for download and directory requests
leaving channels A, B, and C (145.900, 145.920, and 145.940 Mhz) for file
uploads and digi users.
Stations uploading files should stay off of the download/directory/fill
request channel D as their longer uplink packets will collide with the
shorter request packets. Stations doing downloads and directories should
stay off channels A, B, and C since their frequent but short requests will
collide with longer uplink attempts seriously degrading uplink performance.
Another benefit of using this procedure, while most of the uplink activity
to AO-16 will be on channel D (145.960) this frequency is high enough in the
passband of AO-13 that QRMing our fellow operators will be kept to a minumum
when Pacsat crosses beneath AO-13's path.

Recommended AO-16 operating practice in summary:

Downlinks: 437.050 (also 2400.143 on experimenter's day.)
Uplinks: 145.900 A uploads
145.920 B uploads
145.940 C uploads
145.960 D downloads, fills and directory requests

WJ9F / AO-16 Command Team Leader
/EX
```

16. Meteosat frequencies

Newsgroup: rec.radio.amateur.space
Date: 1994-01-06 10:50:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.159.1818.0NC5B6D2@compart.fi>
Source record: 28270

We are building Meteosat receiving system. Does anyone know
what are accurate frequencies for Meteosat 4 and Meteosat 6?

Leo Wikholm

---
internet: leo.wikholm@compart.fi

17. Re: Post your Sat-Track software pick here

Newsgroup: rec.radio.amateur.space
Date: 1994-01-06 23:19:50 UTC
From: ab376@FreeNet.Carleton.CA
Message-ID: <CJ8E53.6Fq@freenet.carleton.ca>
Source record: 28271

For all you MAC fans out there, the Orbitrack is the best I have
seen. An excellent map of the world with orbits plotted in real
time, plus the ability to crank out all kinds of tables of data.
--
###
Mike Ligeza Snr.- VE3UIL
Ottawa, Ontario
Canada

18. ORBS$007.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 13:51:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-007.o.1994@ampr.org>
Source record: 28274
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-007.O
Orbital Elements 007.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX January 7, 1994
BID: $ORBS-007.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94005.12150341
Element set: 239
Inclination: 27.2067 deg
RA of node: 348.0660 deg
Eccentricity: 0.6021024
Arg of perigee: 143.8064 deg
Mean anomaly: 278.2612 deg
Mean motion: 2.05878444 rev/day
Decay rate: -7.5e-07 rev/day^2
Epoch rev: 7942
Checksum: 275

Satellite: UO-11
Catalog number: 14781
Epoch time: 94005.59076342
Element set: 645
Inclination: 97.7949 deg
RA of node: 27.8697 deg
Eccentricity: 0.0013065
Arg of perigee: 69.6655 deg
Mean anomaly: 290.5953 deg
Mean motion: 14.69115948 rev/day
Decay rate: 4.22e-06 rev/day^2
Epoch rev: 52643
Checksum: 347

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 93362.24286562
Element set: 841
Inclination: 82.9283 deg
RA of node: 95.2053 deg
Eccentricity: 0.0012703
Arg of perigee: 133.8292 deg
```

Mean anomaly: 226.3913 deg
Mean motion: 13.72328759 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 32646
Checksum: 308

Satellite: AO-13
Catalog number: 19216
Epoch time: 94004.70116240
Element set: 853
Inclination: 57.8718 deg
RA of node: 275.2489 deg
Eccentricity: 0.7205805
Arg of perigee: 332.1178 deg
Mean anomaly: 3.3712 deg
Mean motion: 2.09722778 rev/day
Decay rate: -3.37e-06 rev/day^2
Epoch rev: 4258
Checksum: 305

Satellite: FO-20
Catalog number: 20480
Epoch time: 93364.10373196
Element set: 640
Inclination: 99.0174 deg
RA of node: 183.0203 deg
Eccentricity: 0.0541189
Arg of perigee: 2.6742 deg
Mean anomaly: 357.7056 deg
_Mean motion: 12.83223163 rev/day
Decay rate: -1.8e-07 rev/day^2
Epoch rev: 18244
Checksum: 281

Satellite: AO-21
Catalog number: 21087
Epoch time: 94002.21124407
Element set: 402
Inclination: 82.9442 deg
RA of node: 265.5312 deg
Eccentricity: 0.0034603
Arg of perigee: 184.9174 deg
Mean anomaly: 175.1647 deg
Mean motion: 13.74530946 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 14678
Checksum: 289

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94003.81201797

Element set: 644
Inclination: 82.9224 deg
RA of node: 133.3515 deg
Eccentricity: 0.0028470
Arg of perigee: 204.2513 deg
Mean anomaly: 155.7306 deg
Mean motion: 13.74032105 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 14607
Checksum: 264

Satellite: ARSENE
Catalog number: 22654
Epoch time: 93321.93138545
Element set: 210
Inclination: 1.4185 deg
RA of node: 113.8817 deg
Eccentricity: 0.2935300
Arg of perigee: 161.0091 deg
Mean anomaly: 211.2000 deg
Mean motion: 1.42195961 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 275
Checksum: 241

/EX

19. ORBS$007.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 13:54:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-007.d.1994@ampr.org>
Source record: 28275
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-007.D
Orbital Elements 007.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX January 7, 1994
BID: $ORBS-007.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94005.38579769
Element set: 944
Inclination: 98.6022 deg
RA of node: 92.3141 deg
Eccentricity: 0.0010623
Arg of perigee: 314.0719 deg
Mean anomaly: 45.9578 deg
Mean motion: 14.29814607 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 20632
Checksum: 305

Satellite: AO-16
Catalog number: 20439
Epoch time: 94005.72754607
Element set: 745
Inclination: 98.6104 deg
RA of node: 93.7213 deg
Eccentricity: 0.0011015
Arg of perigee: 313.5668 deg
Mean anomaly: 46.4599 deg
Mean motion: 14.29870637 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 20638
Checksum: 310

Satellite: DO-17
Catalog number: 20440
Epoch time: 94002.19917332
Element set: 744
Inclination: 98.6107 deg
RA of node: 90.5019 deg
Eccentricity: 0.0011449
Arg of perigee: 322.9054 deg
```

Mean anomaly: 37.1337 deg
Mean motion: 14.30007759 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 20589
Checksum: 285

Satellite: WO-18
Catalog number: 20441
Epoch time: 94005.74014108
Element set: 729
Inclination: 98.6102 deg
RA of node: 94.0149 deg
Eccentricity: 0.0011724
Arg of perigee: 313.2067 deg
Mean anomaly: 46.8135 deg
Mean motion: 14.29985383 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 20640
Checksum: 282

Satellite: LO-19
Catalog number: 20442
Epoch time: 94005.51918470
Element set: 744
Inclination: 98.6116 deg
RA of node: 94.0172 deg
Eccentricity: 0.0012086
Arg of perigee: 313.0601 deg
Mean anomaly: 46.9565 deg
Mean motion: 14.30078732 rev/day
Decay rate: 7.1e-07 rev/day^2
Epoch rev: 20638
Checksum: 283

Satellite: UO-22
Catalog number: 21575
Epoch time: 94005.74855109
Element set: 445
Inclination: 98.4531 deg
RA of node: 83.4070 deg
Eccentricity: 0.0008662
Arg of perigee: 56.6893 deg
Mean anomaly: 303.5122 deg
Mean motion: 14.36879718 rev/day
Decay rate: 1.32e-06 rev/day^2
Epoch rev: 12975
Checksum: 315

Satellite: KO-23
Catalog number: 22077
Epoch time: 94002.16351446

Element set: 340
Inclination: 66.0861 deg
RA of node: 267.5903 deg
Eccentricity: 0.0007830
Arg of perigee: 328.5974 deg
Mean anomaly: 31.4576 deg
Mean motion: 12.86282748 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 6543
Checksum: 304

Satellite: AO-27
Catalog number: 22825
Epoch time: 94002.41089026
Element set: 242
Inclination: 98.6729 deg
RA of node: 79.7643 deg
Eccentricity: 0.0008661
Arg of perigee: 340.3461 deg
Mean anomaly: 19.7388 deg
Mean motion: 14.27598458 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 1403
Checksum: 318

Satellite: IO-26
Catalog number: 22826
Epoch time: 94002.12352015
Element set: 243
Inclination: 98.6726 deg
RA of node: 79.4914 deg
Eccentricity: 0.0009286
Arg of perigee: 340.8280 deg
Mean anomaly: 19.2572 deg
Mean motion: 14.27701091 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 1399
Checksum: 296

Satellite: KO-25
Catalog number: 22830
Epoch time: 94001.47087182
Element set: 243
Inclination: 98.5724 deg
RA of node: 77.8609 deg
Eccentricity: 0.0010938
Arg of perigee: 310.1599 deg
Mean anomaly: 49.8622 deg
Mean motion: 14.28025206 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 1390

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Checksum: 296

/EX
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20. ORBS$007.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 13:56:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-007.w.1994@ampr.org>
Source record: 28276
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-007.W
Orbital Elements 007.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX January 7, 1994
BID: $ORBS-007.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94004.88072055
Element set: 658
Inclination: 99.0751 deg
RA of node: 53.2732 deg
Eccentricity: 0.0014731
Arg of perigee: 323.5684 deg
Mean anomaly: 36.4491 deg
Mean motion: 14.13576766 rev/day
Decay rate: 1.14e-06 rev/day^2
Epoch rev: 46727
Checksum: 314

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94005.03264269
Element set: 557
Inclination: 98.5120 deg
RA of node: 19.0011 deg
Eccentricity: 0.0014259
Arg of perigee: 84.5560 deg
Mean anomaly: 275.7243 deg
Mean motion: 14.24855080 rev/day
Decay rate: 8.8e-07 rev/day^2
Epoch rev: 37937
Checksum: 308

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94001.61189588
Element set: 242
Inclination: 82.5416 deg
RA of node: 41.0968 deg
Eccentricity: 0.0015539
Arg of perigee: 292.3032 deg
```

Mean anomaly: 67.6473 deg
Mean motion: 13.84703832 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 29930
Checksum: 312

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94005.65843375
Element set: 244
Inclination: 82.5449 deg
RA of node: 78.7070 deg
Eccentricity: 0.0016262
Arg of perigee: 312.3715 deg
Mean anomaly: 47.6029 deg
Mean motion: 13.16963362 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26186
Checksum: 304

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94004.92011509
Element set: 458
Inclination: 99.1565 deg
RA of node: 349.9679 deg
Eccentricity: 0.0011085
Arg of perigee: 230.8219 deg
Mean anomaly: 129.1969 deg
Mean motion: 14.12946589 rev/day
Decay rate: 9.6e-07 rev/day^2
Epoch rev: 27216
Checksum: 334

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94002.20370060
Element set: 243
Inclination: 82.5242 deg
RA of node: 276.2482 deg
Eccentricity: 0.0014430
Arg of perigee: 338.9778 deg
Mean anomaly: 21.0787 deg
Mean motion: 13.84353419 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 24472
Checksum: 296

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 93364.48539230

Element set: 957
Inclination: 82.5490 deg
RA of node: 26.6237 deg
Eccentricity: 0.0006048
Arg of perigee: 3.1578 deg
Mean anomaly: 356.9573 deg
Mean motion: 13.04419292 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 20090
Checksum: 295

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94005.87923448
Element set: 744
Inclination: 82.5450 deg
RA of node: 337.3863 deg
Eccentricity: 0.0014678
Arg of perigee: 242.2637 deg
Mean anomaly: 117.7035 deg
Mean motion: 13.84185748 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 17816
Checksum: 327

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94003.03844225
Element set: 862
Inclination: 98.8453 deg
RA of node: 28.3934 deg
Eccentricity: 0.0015034
Arg of perigee: 108.6050 deg
Mean anomaly: 249.2585 deg
Mean motion: 14.01339724 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 17057
Checksum: 297

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94005.74063050
Element set: 743
Inclination: 82.5267 deg
RA of node: 275.2236 deg
Eccentricity: 0.0013392
Arg of perigee: 137.9258 deg
Mean anomaly: 222.2933 deg
Mean motion: 13.83569469 rev/day
Decay rate: 1.11e-06 rev/day^2
Epoch rev: 16529

Checksum: 302

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94005.83128273
Element set: 651
Inclination: 82.5467 deg
RA of node: 284.3740 deg
Eccentricity: 0.0011499
Arg of perigee: 231.4753 deg
Mean anomaly: 128.5339 deg
Mean motion: 13.16458488 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 12999
Checksum: 315

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94004.08081272
Element set: 864
Inclination: 98.6370 deg
RA of node: 35.3435 deg
Eccentricity: 0.0013145
g of perigee: 356.9160 deg
Mean anomaly: 3.1933 deg
Mean motion: 14.22352847 rev/day
Decay rate: 1.66e-06 rev/day^2
Epoch rev: 13720
qChecksum: 273

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94005.68770103
Element set: 647
Inclination: 82.5545 deg
RA of node: 231.4938 deg
Eccentricity: 0.0012197
Arg of perigee: 243.1016 deg
Mean anomaly: 116.8860 deg
Mean motion: 13.16826637 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 11507
Checksum: 294

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94001.96917156
Element set: 243
Inclination: 82.5480 deg
RA of node: 338.1541 deg
Eccentricity: 0.0022340

```
Arg of perigee: 335.8493 deg
Mean anomaly: 24.1619 deg
Mean motion: 13.82995595 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 1711
Checksum: 298

/EX
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21. ORBS$007.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 14:00:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-007.m.1994@ampr.org>
Source record: 28273
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-007.M
Orbital Elements 007.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX January 7, 1994
BID: $ORBS-007.M
TO ALL RADIO AMATEURS BT

Satellite: MIR
Catalog number: 16609
Epoch time: 94005.22314691
Element set: 72
Inclination: 51.6193 deg
RA of node: 284.4311 deg
Eccentricity: 0.0005853
Arg of perigee: 164.6911 deg
Mean anomaly: 195.4261 deg
Mean motion: 15.59559673 rev/day
Decay rate: 1.2629e-04 rev/day^2
Epoch rev: 45062
Checksum: 301

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94004.90469308
Element set: 415
Inclination: 28.4684 deg
RA of node: 204.6894 deg
Eccentricity: 0.0006313
Arg of perigee: 180.1183 deg
Mean anomaly: 179.9404 deg
Mean motion: 14.90410640 rev/day
Decay rate: 1.033e-05 rev/day^2
Epoch rev: 500
Checksum: 264

Satellite: GRO
Catalog number: 21225
Epoch time: 94004.88663637
Element set: 42
Inclination: 28.4636 deg
RA of node: 284.9027 deg
Eccentricity: 0.0003711
Arg of perigee: 171.8955 deg
```

Mean anomaly: 188.1707 deg
Mean motion: 15.39742393 rev/day
Decay rate: 5.841e-05 rev/day^2
Epoch rev: 3173
Checksum: 309

Satellite: UARS
Catalog number: 21701
Epoch time: 94004.24257924
Element set: 446
Inclination: 56.9823 deg
RA of node: 95.9801 deg
Eccentricity: 0.0005475
Arg of perigee: 107.2007 deg
Mean anomaly: 252.9626 deg
Mean motion: 14.96383081 rev/day
Decay rate: 2.801e-05 rev/day^2
Epoch rev: 12639
Checksum: 295

Satellite: POSAT
Catalog number: 22829
Epoch time: 94001.75322183
Element set: 235
Inclination: 98.6670 deg
RA of node: 79.1269 deg
Eccentricity: 0.0010186
Arg of perigee: 328.1394 deg
Mean anomaly: 31.9170 deg
Mean motion: 14.27993596 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 1394
Checksum: 310

/EX

22. ORBS$007.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 14:02:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-007.n.1994@ampr.org>
Source record: 28277
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-007.N
2Line Orbital Elements 007.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX January 7, 1994
BID: $ORBS-007.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94005.12150341 -.00000075 00000-0 10000-3 0 2390
2 14129 27.2067 348.0660 6021024 143.8064 278.2612 2.05878444 79423
UO-11
1 14781U 84021B 94005.59076342 .00000422 00000-0 79591-4 0 6451
2 14781 97.7949 27.8697 0013065 69.6655 290.5953 14.69115948526430
RS-10/11
1 18129U 87054A 93362.24286562 .00000047 00000-0 35308-4 0 8413
2 18129 82.9283 95.2053 0012703 133.8292 226.3913 13.72328759326464
AO-13
1 19216U 88051B 94004.70116240 -.00000337 00000-0 10000-4 0 8537
2 19216 57.8718 275.2489 7205805 332.1178 3.3712 2.09722778 42585
FO-20
1 20480U 90013C 93364.10373196 -.00000018 00000-0 32924-4 0 6409
2 20480 99.0174 183.0203 0541189 2.6742 357.7056 12.83223163182445
AO-21
1 21087U 91006A 94002.21124407 .00000094 00000-0 82657-4 0 4024
2 21087 82.9442 265.5312 0034603 184.9174 175.1647 13.74530946146782
RS-12/13
1 21089U 91007A 94003.81201797 .00000013 00000-0 -16601-5 0 6449
2 21089 82.9224 133.3515 0028470 204.2513 155.7306 13.74032105146079
ARSENE
1 22654U 93031B 93321.93138545 -.00000051 00000-0 10000-3 0 2108
2 22654 1.4185 113.8817 2935300 161.0091 211.2000 1.42195961 2757
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1 20437U 90005B 94005.38579769 .00000070 00000-0 44144-4 0 9440
2 20437 98.6022 92.3141 0010623 314.0719 45.9578 14.29814607206325
AO-16
1 20439U 90005D 94005.72754607 .00000051 00000-0 36929-4 0 7456
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2 20439 98.6104 93.7213 0011015 313.5668 46.4599 14.29870637206386
DO-17
1 20440U 90005E 94002.19917332 .00000053 00000-0 37608-4 0 7448
2 20440 98.6107 90.5019 0011449 322.9054 37.1337 14.30007759205895
WO-18
1 20441U 90 5 F 94005.74014108 .00000072 00000-0 35573-4 0 7295
2 20441 98.6102 94.0149 0011724 313.2067 46.8135 14.29985383206404
LO-19
1 20442U 90005G 94005.51918470 .00000071 00000-0 44573-4 0 7442
2 20442 98.6116 94.0172 0012086 313.0601 46.9565 14.30078732206388
UO-22
1 21575U 91050B 94005.74855109 .00000132 00000-0 59080-4 0 4450
2 21575 98.4531 83.4070 0008662 56.6893 303.5122 14.36879718129757
KO-23
1 22077U 92052B 94002.16351446 -.00000037 00000-0 10000-3 0 3406
2 22077 66.0861 267.5903 0007830 328.5974 31.4576 12.86282748 65437
AO-27
1 22825U 93061C 94002.41089026 .00000028 00000-0 29480-4 0 2421
2 22825 98.6729 79.7643 0008661 340.3461 19.7388 14.27598458 14037
IO-26
1 22826U 93061D 94002.12352015 .00000048 00000-0 37498-4 0 2432
2 22826 98.6726 79.4914 0009286 340.8280 19.2572 14.27701091 13994
KO-25
1 22830U 93061H 94001.47087182 .00000044 00000-0 35071-4 0 2435
2 22830 98.5724 77.8609 0010938 310.1599 49.8622 14.28025206 13902
NOAA-9
1 15427U 84123A 94004.88072055 .00000114 00000-0 84883-4 0 6582
2 15427 99.0751 53.2732 0014731 323.5684 36.4491 14.13576766467270
NOAA-10
1 16969U 86073A 94005.03264269 .00000088 00000-0 55595-4 0 5574
2 16969 98.5120 19.0011 0014259 84.5560 275.7243 14.24855080379375
MET-2/17
1 18820U 88005A 94001.61189588 .00000083 00000-0 60731-4 0 2423
2 18820 82.5416 41.0968 0015539 292.3032 67.6473 13.84703832299304
MET-3/2
1 19336U 88064A 94005.65843375 .00000051 00000-0 10000-3 0 2440
2 19336 82.5449 78.7070 0016262 312.3715 47.6029 13.16963362261865
NOAA-11
1 19531U 88089A 94004.92011509 .00000096 00000-0 76385-4 0 4584
2 19531 99.1565 349.9679 0011085 230.8219 129.1969 14.12946589272167
MET-2/18
1 19851U 89018A 94002.20370060 .00000075 00000-0 53970-4 0 2435
2 19851 82.5242 276.2482 0014430 338.9778 21.0787 13.84353419244722
MET-3/3
1 20305U 89086A 93364.48539230 .00000044 00000-0 10000-3 0 9576
2 20305 82.5490 26.6237 0006048 3.1578 356.9573 13.04419292200902
MET-2/19
1 20670U 90057A 94005.87923448 .00000024 00000-0 79036-5 0 7443
2 20670 82.5450 337.3863 0014678 242.2637 117.7035 13.84185748178162
FY-1/2
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1 20788U 90081A 94003.03844225 -.00000027 00000-0 10000-4 0 8621
2 20788 98.8453 28.3934 0015034 108.6050 249.2585 14.01339724170575
MET-2/20
1 20826U 90086A 94005.74063050 .00000111 00000-0 87297-4 0 7431
2 20826 82.5267 275.2236 0013392 137.9258 222.2933 13.83569469165290
MET-3/4
1 21232U 91030A 94005.83128273 .00000050 00000-0 10000-3 0 6519
2 21232 82.5467 284.3740 0011499 231.4753 128.5339 13.16458488129990
NOAA-12
1 21263U 91032A 94004.08081272 .00000166 00000-0 93828-4 0 8642
2 21263 98.6370 35.3435 0013145 356.9160 3.1933 14.22352847137206
MET-3/5
1 21655U 91056A 94005.68770103 .00000051 00000-0 10000-3 0 6470
2 21655 82.5545 231.4938 0012197 243.1016 116.8860 13.16826637115074
MET-2/21
1 22782U 93055A 94001.96917156 .00000034 00000-0 17490-4 0 2435
2 22782 82.5480 338.1541 0022340 335.8493 24.1619 13.82995595 17110
MIR
1 16609U 86017A 94005.22314691 .00012629 00000-0 16182-3 0 723
2 16609 51.6193 284.4311 0005853 164.6911 195.4261 15.59559673450621
HUBBLE
1 20580U 90037B 94004.90469308 .00001033 00000-0 88413-4 0 4158
2 20580 28.4684 204.6894 0006313 180.1183 179.9404 14.90410640 5005
GRO
1 21225U 91027B 94004.88663637 .00005841 00000-0 13675-3 0 427
2 21225 28.4636 284.9027 0003711 171.8955 188.1707 15.39742393 31735
UARS
1 21701U 91063B 94004.24257924 .00002801 00000-0 26628-3 0 4467
2 21701 56.9823 95.9801 0005475 107.2007 252.9626 14.96383081126392
POSAT
1 22829U 93061G 94001.75322183 .00000049 00000-0 37763-4 0 2353
2 22829 98.6670 79.1269 0010186 328.1394 31.9170 14.27993596 13944
/EX
```

23. Keplerian data for moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 14:47:35 UTC
From: mawhinne@shrike.und.ac.za
Message-ID: <2gjsm7$7ju@owl.und.ac.za>
Source record: 28272

Hi!

I have a friend who is interested in doing some moon-bounce work, and wants to be able to accurately track the position of the moon.

I've had a quick look through the FAQ, but I couldn't find any pointers to Keplerian data on the internet. Is there an FTP site for Keplerian data? Or can someone send me the Keplerian elements for the moon?

Thanks,
Bryan

--
mawhinne@shrike.und.ac.za

Bryan Mawhinney
Department of Computer Science
University of Natal, Durban
Republic of South Africa

24. ARLS001 NASA tv moves

Newsgroup: rec.radio.amateur.space
Date: 1994-01-07 19:14:44 UTC
From: arrl@BIX.com
Message-ID: <$arls001.1994@ampr.org>
Source record: 28278
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SPACE @ ARL $ARLS001
ARLS001 NASA tv moves

ZCZC AS45
QST de W1AW
Space Bulletin 001 ARLS001
From ARRL Headquarters
Newington, CT January 6, 1994
To all radio amateurs

SB SPACE ARL ARLS001
ARLS001 NASA tv moves

NASA tv moves

NASA Television is moving. NASA TV is received by dish or
available through your local cable television network.
The new satellite is Spacenet 2, transponder 5, C Band, 69
degrees West longitude, frequency 3880.0 MHz, horizontal
polarization, audio on 6.8 MHz. The NASA Television
service offers daily educational and information
programming, carries Shuttle launches and mission
coverage, and occasionally airs live coverage of Shuttle
Amateur Radio EXperiment activity. The move will occur at
1500 UTC on Saturday, January 8. For more information,
please contact the ARRL Educational Activities
Department.
NNNN
/EX
```

25. Two-Line Orbital Element Sets (TLE322)

Newsgroup: rec.radio.amateur.space
Date: 1994-01-08 04:53:31 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.758004811@afit.af.mil>
Source record: 28282
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #322 -
Alouette 1
1 00424U 62049 94006.17746459 .00000096 00000-0 10288-3 0 9574
2 00424 80.4668 84.8547 0023599 169.8147 190.3481 13.67793710560252
ATS 3
1 03029U 67111A 94002.44056415 -.00000108 00000-0 10000-3 0 1428
2 03029 14.5361 9.1622 0011974 261.3446 244.5879 1.00273300 95777
Cosmos 398
1 04966U 71016A 94007.02432706 .00069357 58601-5 16560-3 0 9271
2 04966 51.4670 225.7625 1186514 259.1043 87.4446 13.50462414750666
Starlette
1 07646U 75010A 93362.37615721 -.00000142 00000-0 16847-5 0 7505
2 07646 49.8197 107.3933 0206210 132.1264 229.7358 13.82184946954223
LAGEOS
1 08820U 76039A 94006.19009009 -.00000002 00000-0 10000-3 0 9560
2 08820 109.8483 80.1127 0044163 319.8847 39.8677 6.38664472156806
ETS-2
1 09852U 77014A 94003.77233256 -.00000252 00000-0 10000-3 0 9347
2 09852 11.8599 43.5319 0000718 56.5118 71.4245 1.00023448 9011
GOES 2
1 10061U 77048A 94006.19475029 .00000068 00000-0 10000-3 0 2700
2 10061 10.9007 47.6862 0002421 7.1608 345.6385 1.00286071 5487
IUE
1 10637U 78012A 94007.16505068 -.00000278 00000-0 10000-3 0 9628
2 10637 34.3384 97.5073 1305452 31.1079 345.7859 1.00255643 11117
GPS BI-01
1 10684U 78020A 94006.17090554 -.00000029 00000-0 10000-3 0 2467
2 10684 64.5602 50.3445 0063759 164.1409 196.0982 1.98070233101729
GPS BI-02
1 10893U 78047A 93363.13793728 -.00000024 00000-0 10000-3 0 285
```

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2 10893 63.5943 289.9149 0213378 13.7113 346.8850 2.01627319114646
GOES 3
1 10953U 78062A 94007.25620745 .00000061 00000-0 10000-3 0 2648
2 10953 9.8318 50.4252 0005264 127.8437 205.3677 1.00263880 10106
SeaSat 1
1 10967U 78064A 94006.23554674 .00000111 00000-0 81382-4 0 2568
2 10967 107.9988 127.0459 0002635 240.2591 119.8288 14.37908896813086
GPS BI-03
1 11054U 78093A 94004.94452648 -.00000045 00000-0 10000-3 0 1522
2 11054 63.3081 286.5873 0043230 175.1298 184.9559 1.93505054111352
Nimbus 7
1 11080U 78098A 93364.69102176 -.00000040 00000-0 22074-5 0 3572
2 11080 99.0743 249.3907 0008264 223.0951 136.9558 13.83726495766778
GPS BI-04
1 11141U 78112A 94005.05940364 -.00000030 00000-0 00000+0 0 8538
2 11141 64.5585 51.3349 0047906 24.8341 335.4604 1.92894225 632
GPS BI-05
1 11690U 80011A 94003.36820625 -.00000021 00000-0 10000-3 0 7395
2 11690 64.9019 52.2576 0141985 198.3528 161.1883 2.00550497116232
GPS BI-06
1 11783U 80032A 94007.27451215 -.00000046 00000-0 10000-3 0 9502
2 11783 62.7170 283.5696 0205909 29.7095 331.5105 2.03457907100681
GOES 5
1 12472U 81049A 93364.79136716 .00000112 00000-0 10000-3 0 7348
2 12472 6.4748 60.0660 0004166 5.4246 178.1025 1.00253971 4076
Cosmos 1383
1 13301U 82066A 94006.17767107 .00000042 00000-0 31421-4 0 2551
2 13301 82.9321 68.5526 0027199 178.5771 181.5464 13.68048798575270
LandSat 4
1 13367U 82072A 94006.14033758 .00000238 00000-0 62859-4 0 4317
2 13367 98.2034 67.4127 0008067 42.2391 317.9428 14.57106564610467
IRAS
1 13777U 83004A 94006.01949604 -.00000076 00000-0 -22650-4 0 5600
2 13777 98.9699 200.3020 0012916 45.8985 314.3240 13.99183937228464
Cosmos 1447
1 13916U 83021A 94006.13113998 .00000079 00000-0 66994-4 0 3558
2 13916 82.9473 131.5586 0039110 119.7875 240.7191 13.74302938541077
TDRS 1
1 13969U 83026B 94005.75442593 -.00000349 00000-0 10000-4 0 2584
2 13969 7.3798 52.7518 0016277 110.5713 348.3433 0.99849202 12423
GOES 6
1 14050U 83041A 94003.06129278 -.00000207 00000-0 10000-3 0 1487
2 14050 5.2229 62.8195 0008548 313.1410 24.6291 1.00234534 11122
OSCAR 10
1 14129U 83058B 94005.12150341 -.00000075 00000-0 10000-3 0 2390
2 14129 27.2067 348.0660 6021024 143.8064 278.2612 2.05878444 51456
LandSat 5
1 14780U 84021A 94006.17885502 .00000202 00000-0 54827-4 0 153
2 14780 98.1886 68.9840 0005792 48.5535 311.6160 14.57128942523887
UoSat 2
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1 14781U 84021B 94006.06752827 .00000426 00000-0 80258-4 0 6550
2 14781 97.7949 28.3246 0013056 68.2254 292.0340 14.69116428526505
GPS BI-09
1 15039U 84059A 94005.68946417 -.00000029 00000-0 10000-3 0 1603
2 15039 63.8646 46.1298 0056852 218.2021 141.4558 2.00560536 70085
Cosmos 1574
1 15055U 84062A 94005.99761134 .00000033 00000-0 19179-4 0 5559
2 15055 82.9552 184.6436 0026917 310.4466 49.4342 13.73598212478365
GPS BI-10
1 15271U 84097A 94006.11580522 -.00000046 00000-0 10000-3 0 7608
2 15271 62.4456 283.6085 0142220 346.8665 12.8040 2.00576403 67203
Cosmos 1602
1 15331U 84105A 94006.11485803 .00000707 00000-0 81320-4 0 2513
2 15331 82.5350 229.4542 0021693 21.6638 338.5490 14.84240495500472
NOAA 9
1 15427U 84123A 94006.22557122 .00000121 00000-0 88650-4 0 6691
2 15427 99.0751 54.6374 0014730 319.7259 40.2820 14.13577301467467
GPS BI-11
1 16129U 85093A 94005.35689444 -.00000028 00000-0 10000-3 0 5569
2 16129 64.6183 48.2042 0131080 141.6256 219.3770 2.00563684 6893
Mir
1 16609U 86017A 94006.24838594 .00011734 00000-0 15070-3 0 832
2 16609 51.6190 279.2758 0005534 168.7781 191.3337 15.59583166450781
SPOT 1
1 16613U 86019A 94006.22371216 .00000089 00000-0 62356-4 0 6231
2 16613 98.7080 82.6313 0000774 77.5775 282.5488 14.20015902 93575
Cosmos 1766
1 16881U 86055A 94006.19848674 .00000922 00000-0 10937-3 0 1532
2 16881 82.5199 287.4567 0021341 43.5731 316.7164 14.83278599401440
EGP
1 16908U 86061A 94006.00459662 -.00000083 00000-0 10000-3 0 8542
2 16908 50.0126 223.0136 0011184 259.7730 100.1844 12.44409100336572
NOAA 10
1 16969U 86073A 94006.22642576 .00000086 00000-0 54801-4 0 5686
2 16969 98.5121 20.1587 0014293 81.3769 278.9029 14.24855355379542
MOS-1
1 17527U 87018A 94006.23556938 .00000090 00000-0 99794-4 0 156
2 17527 99.0556 78.1848 0001036 33.6802 326.4426 13.94897924350366
GOES 7
1 17561U 87022A 94003.17920865 -.00000037 00000-0 10000-3 0 6737
2 17561 1.1921 77.6540 0002445 322.9330 14.0225 1.00271725 8313
Kvant-1
1 17845U 87030A 94006.95321984 -.00015943 00000-0 -19047-3 0 7191
2 17845 51.6169 275.7336 0005149 170.9807 189.0538 15.59574140450968
DMSP B5D2-3
1 18123U 87053A 94006.19315889 .00000106 00000-0 77112-4 0 2106
2 18123 98.7892 200.2540 0013692 284.8021 75.1635 14.15328293338097
RS-10/11
1 18129U 87054A 93364.64889244 .00000016 00000-0 13499-5 0 8510
2 18129 82.9288 93.4276 0012860 127.5376 232.6947 13.72328401326790
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Meteor 2-16
1 18312U 87068A 94006.00328871 .00000023 00000-0 71609-5 0 2538
2 18312 82.5557 340.4849 0011314 203.1000 156.9650 13.84017693322626
Meteor 2-17
1 18820U 88005A 94006.09190916 .00000052 00000-0 32768-4 0 2523
2 18820 82.5407 37.5322 0015411 278.7146 81.2246 13.84704066299929
DMSP B5D2-4
1 18822U 88006A 94006.05189281 .00000148 00000-0 84276-4 0 3152
2 18822 98.4613 227.5399 0007326 94.5080 265.6935 14.22915731307466
Glonass 34
1 19163U 88043A 94004.17910257 .00000024 00000-0 10000-3 0 8485
2 19163 64.9707 115.9347 0007281 174.4968 185.5206 2.13102006 43168
Glonass 36
1 19165U 88043C 94002.35780210 .00000039 00000-0 10000-3 0 2399
2 19165 64.9771 115.9847 0004121 334.3688 25.5787 2.13102288 43745
METEOSAT 3
1 19215U 88051A 94005.12094838 -.00000250 00000-0 10000-3 0 8488
2 19215 1.3897 72.7908 0005416 221.7301 138.8663 1.00276006 8288
AO-13
1 19216U 88051B 94004.70116240 -.00000337 00000-0 10000-4 0 8537
2 19216 57.8718 275.2489 7205805 332.1178 3.3712 2.09722778 11086
OKEAN 1
1 19274U 88056A 94006.03999573 .00000505 00000-0 60494-4 0 8530
2 19274 82.5156 27.3500 0019581 178.7442 181.3819 14.82053675297062
Meteor 3-2
1 19336U 88064A 94006.19024109 .00000051 00000-0 10000-3 0 2547
2 19336 82.5438 78.3299 0016152 311.4348 48.5385 13.16963186261939
Glonass 39
1 19503U 88085C 94007.07550696 -.00000036 00000-0 10000-3 0 1508
2 19503 65.7326 354.7713 0004854 170.8362 189.2488 2.13102126 41336
NOAA 11
1 19531U 88089A 94006.97369811 .00000109 00000-0 83421-4 0 4712
2 19531 99.1564 352.0670 0011099 225.0503 134.9767 14.12947368272457
TDRS 2
1 19548U 88091B 94007.13647866 -.00000285 00000-0 10000-3 0 8645
2 19548 0.6588 79.0288 0002531 180.4680 194.1442 1.00273648 6594
Glonass 40
1 19749U 89001A 94004.29959507 .00000022 00000-0 10000-3 0 3612
2 19749 64.9408 115.5146 0005961 256.5462 103.3918 2.13101688 38788
Glonass 41
1 19750U 89001B 94006.23343270 -.00000007 00000-0 10000-3 0 2505
2 19750 64.9561 115.5056 0007100 248.1283 111.7946 2.13101705 38846
GPS BII-01
1 19802U 89013A 94005.19317415 .00000061 00000-0 10000-3 0 8585
2 19802 55.0828 146.1731 0035065 174.8982 185.1207 2.00571206 35781
Akebono
1 19822U 89016A 94006.19460853 .00025670 00000-0 14939-2 0 1890
2 19822 75.0892 273.6793 3836589 49.3594 338.2768 7.74326496 96716
Meteor 2-18
1 19851U 89018A 94006.17890495 .00000104 00000-0 79971-4 0 2537
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2 19851 82.5239 273.0797 0014280 327.6375 32.3909 13.84354307245272
MOP-1
1 19876U 89020B 93363.58213919 .00000002 00000-0 10000-3 0 7479
2 19876 0.1430 6.8728 0001408 318.9408 341.2796 1.00266558 5378
TDRS 3
1 19883U 89021B 94002.42255033 -.00000258 00000-0 00000+0 0 8576
2 19883 0.0406 169.8058 0000518 115.2596 287.8029 1.00267832 87809
GPS BII-02
1 20061U 89044A 94006.53242017 -.00000082 00000-0 10000-3 0 8654
2 20061 54.7337 323.0413 0125891 206.2441 153.0986 2.00565929 33557
Nadezhda 1
1 20103U 89050A 94006.18058475 .00000049 00000-0 36101-4 0 9555
2 20103 82.9574 47.2381 0038807 22.6152 337.6702 13.73830917226068
GPS BII-03
1 20185U 89064A 94005.37536236 .00000060 00000-0 10000-3 0 8669
2 20185 54.8975 146.8127 0006501 235.9173 123.9986 2.00548007 32107
GMS 4
1 20217U 89070A 94006.25469777 -.00000281 00000-0 10000-3 0 9695
2 20217 0.1773 68.4781 0000368 268.0219 0.9642 1.00266429 16469
GPS BII-04
1 20302U 89085A 94005.40541983 -.00000015 00000-0 10000-3 0 8674
2 20302 53.6658 263.5274 0005466 322.6900 37.3360 2.00562821 30904
Meteor 3-3
1 20305U 89086A 93364.48539230 .00000044 00000-0 10000-3 0 9576
2 20305 82.5490 26.6237 0006048 3.1578 356.9573 13.04419292200902
COBE
1 20322U 89089A 94005.01425066 -.00000043 00000-0 44508-6 0 9530
2 20322 98.9844 23.2316 0009296 9.5677 350.5663 14.03428700211506
Kvant-2
1 20335U 89093A 94006.95321984 -.00015943 00000-0 -19047-3 0 8102
2 20335 51.6169 275.7336 0005149 170.9807 189.0538 15.59574140450876
GPS BII-05
1 20361U 89097A 94005.41070005 -.00000037 00000-0 10000-3 0 7555
2 20361 55.4326 88.7663 0071217 104.9988 255.8169 2.00567070 20380
SPOT 2
1 20436U 90005A 94006.19194113 .00000095 00000-0 65161-4 0 7329
2 20436 98.7376 82.9104 0000957 45.3983 314.7272 14.20037726205100
UO-14
1 20437U 90005B 94006.22554547 .00000082 00000-0 48814-4 0 9543
2 20437 98.6023 93.1440 0010518 311.4016 48.6262 14.29814904206444
UO-15
1 20438U 90005C 94006.22667407 .00000035 00000-0 31118-4 0 7550
2 20438 98.6030 92.2952 0009557 314.6799 45.3604 14.29157728206375
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1 20439U 90005D 94006.21737978 .00000054 00000-0 38073-4 0 7559
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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26. Keplerian data for moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-08 09:26:00 UTC
From: danny_kohn@sm0nbj.ct.se
Message-ID: <2d2e8a6b@sm0nbj.ct.se>
Source record: 28279

Hej Bryan.

Friday January 07 1994, Bryan Mawhinney writes to All:

BM> From: mawhinne@shrike.und.ac.za (Bryan Mawhinney)

BM> I've had a quick look through the FAQ, but I couldn't find any
BM> pointers to Keplerian data on the internet. Is there an FTP site
BM> for Keplerian data? Or can someone send me the Keplerian
BM> elements for the moon?

I really don't think that there are any keplerian data for the moon. There is
some software availbale for moon tracking though.

H{lsningar
Danny

---
* Origin: danny_kohn@sm0nbj.ct.se (2:201/138.3)

27. Re: Keplerian data for moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-08 15:25:33 UTC
From: zach@gemini.ldc.lu.se
Message-ID: <1994Jan8.152533.20205@nomina.lu.se>
Source record: 28280

In article <2gjsm7$7ju@owl.und.ac.za>, mawhinne@shrike.und.ac.za (Bryan Mawhinney) writes:
>Hi!
>
>I have a friend who is interested in doing some moon-bounce work, and wants
>to be able to accurately track the position of the moon.
>
>I've had a quick look through the FAQ, but I couldn't find any
>pointers to Keplerian data on the internet. Is there an FTP site for
>Keplerian data? Or can someone send me the Keplerian elements for the
>moon?
>
>Thanks,
> Bryan
I dont think you need keppler elements for the moon if you get
a trackingprogram that have the moon and the sun "hardcoded" in the program
itself.
One such program is the Instant Tracker as i myself use for satellite tracking
i actually calibrated my antenna systems by pointing at the moon and then run
outdoors to adjust the mecanic fastingpoints and adjustment of my rotor and
mast.
When i checked this against satellite AOS and LOS and also with a magnetic
compass a was startled with the accurasy.
So if you are using a PC computer i sugest using Instant tracker.
You can get from the American Radio Relay League
Newington, CT 06111 USA

Good luck with the moon tracking.

ZACH@GEMINI.LDC.LU.SE

Harry Zachrisson (SM7PNV)

>
>--
>mawhinne@shrike.und.ac.za
>
>Bryan Mawhinney
>Department of Computer Science
>University of Natal, Durban
>Republic of South Africa
>

28. Re: Keplerian data for moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-09 00:13:49 UTC
From: jsi@vipunen.hut.fi
Message-ID: <2gni7t$e8u@nntp.hut.fi>
Source record: 28281

>I dont think you need keppler elements for the moon if you get
>a trackingprogram that have the moon and the sun "hardcoded" in the program
>itself.
>One such program is the Instant Tracker as i myself use for satellite tracking

There are quite a few programs available designed especially for EME. And they
are _much_ better than those designed to track satellites. One of the best
is made by VK3UM. And you'll get it for free ! Try your local ftp site or
ftp.funet.fi (128.214.6.100), the path is pub/ham/vhf-work/eme-vk3um.zip

I have been very pleased with this one but I would like to hear what
kind of features does ie W5UN's program have. Is it worth the money ?

>Harry Zachrisson (SM7PNV)

Jukka OH6DD

29. Traksat 3.00!

Newsgroup: rec.radio.amateur.space
Date: 1994-01-09 20:33:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.174.1818.0NC5BAD3@compart.fi>
Source record: 28283

According to Paul E. Traufler:

A new version of TRAKSAT is now available to registered users.
This represents a new look and feel for the program. The user
interface has been updated to today's standards with things like
list boxes of satellite names or tracking stations so you don't
have to type anything. Squint angle calculations along with
Doppler shift for uplinks and downlinks are provided. Multi-
satellite modes are greatly improved and several multi-station
modes are now available also. High resolution SVGA modes are
available and improved a monochrome mode. Output to the screen a
file or both can be easily accomplished with this version. Graphic
screens can now be saved to PCX file with just a key press.

Leo Wikholm

30. ANS-008 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-01-10 00:21:44 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-008.01.1994@ampr.org>
Source record: 28284
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-008.01
PoSAT-1 BBS TO OPEN

HR AMSAT NEWS SERVICE BULLETIN 008.01 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 8, 1993
TO ALL RADIO AMATEURS BT
BID: $ANS-008.01

PoSAT-1 Opens For Radio Amateur Use

As many of you may already know, PoSAT-1 was built at University of Surrey and is owned by a Portuguese Industrial Consortium. It carries a commercial and an Amateur Radio payload. The Amateur Service hasn't yet started operation because of some doubts about the use of PoSAT-1 were brought up because of the the possiblity of misuse of the Amateur Radio spectrum.

AMSAT-PO (the Portuguese AMSAT "branch") and others were very worried about this situation, and after a few setbacks and many meetings, a protocol was finally established between the PoSAT Industrial Consortium and AMSAT-PO on 6-DEC-93. The main concern of AMSAT-PO was always to protect the Amateur bands and the Amateur code and practice.

Jose Carlos (CT1ERC) has provided the main points of that agreement which are as follows:

* RAM memory allocated to the Amateur store-and-forward BBS: at least 6 MB out of a total of 16 MB;

* The operating schedule (between the commercial and Amateur service) will be valid for two years and may be re-negotiated every two years;

* The Amateur ground stations are allowed to download all the files related to the technical and scientific experiments onboard, but by imposition of the Consortium, the IMAGES TAKEN BY THE ONBOARD CCD CAMERAS WILL NOT BE MADE AVAILABLE TO THE AMATEUR RADIO SERVICE!!!

In a meeting held recently between AMSAT-PO officials and the PoSAT Consortium the schedule approved is as follows:

EVERY minute PoSAT will be 5 seconds in the commercial frequencies and the remaining 55 seconds in the amateur frequencies. The Consortium feels that they need at lest 5 seconds to download the images. The telemetry will be downloaded in the amateur frequencies as well. This schedule will be valid starting on 07-JAN-94.

Since the amateurs aren't allowed to download the image files from the onboard cameras, there are the two experiments that will, however, be quite

interesting. The are the following:

1) The onboard GPS receiver: if everything goes as expected, the days of difficult tracking are over. Just wait the AOS and the satellite will tell you were it is and where to point your antennas, if you know your QTH position.

2) The possibility of operation at 38.4 Kbps provided through the DSP system, which is will allow the amateurs to develope the necessary RF and digital techniques to go beyond 9600 baud. Imagine receiving about 100 Kbytes file in just 5 seconds!

PoSAT-1 will benefit mostly the amateurs that have 9600 baud operational capability and since there are only two of 9600 baud capable stations at the present time in Portugal operating regularly using these birds, your suggestions and comments would be most appreciated and might help AMSAT-PO in their contacts and negotiations with the PoSAT Consortium through AMSAT-PO.

The following are the PoSAT-1 radio amateur frequencies:

PoSat-1 Transponder Frequencies

UPLINK 145.975 MHz 145.925 MHz (Secondary)
DONWLINK 435.075 MHz 435.050 MHz (Secondary)

BBSCALL: posat-11 posat-12

[The AMSAT News Service (ANS) would like to thank Jose Carlos (CT1ERC) for this bulletin item. CT1ERC can receive your inquiries and comments on the BBS of KO-23 or at his INTERNET mailbox address of: J_CARDOSO%utad.pt@nunes.uminho.pt]

/EX
SB SAT @ AMSAT $ANS-008.02
MIR GETS A NEW CREW

HR AMSAT NEWS SERVICE BULLETIN 008.02 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 8, 1993
TO ALL RADIO AMATEURS BT
BID: $ANS-008.02

New Cosmonauts To Begin Stay on MIR

Today, 08-JAN-94, a Soyuz TM-18 spacecraft was launched from Baikonur at 10:08 UTC with three cosmonauts aboard. The new cosmonauts are Victor Afanassiev (U9MIR), Yuri Usachov (R3MIR), and Valery Poliakov (U3MIR). The TM-18 spacecraft is scheduled to dock with the MIR space station on 10-JAN-94. The cosmonauts that are currently aboard MIR,Vassili Tsybliev and Alexander Serebrov (R0MIR), will return to earth on 14-JAN-94.

What is interesting to note about U3MIR is that he will attempt to break Musa Manarov record for remaining in space. U3MIR is a medical doctor and will remain aboard MIR until April '95.

The new MIR QSL Manager is Serge Samburov (RV3DR). He has held that position since January '93. To receive a QSL confirming your MIR contact, send your QSL cards to his postal address of: P.O.BOX 73, Kaliningrad-10 City, Moscow Area, 141070, RUSSIA. Also, you can send your inquiries to the following packet radio address: RV3DR#R#MIR or RV3DR@RK3KP.#MSK.RUS.EU.

[The AMSAT News Service (ANS) would like to thank RV3DR and LW2DTZ for this for the information which went into this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-008.03
STS-60 SAREX MISSION INFO

HR AMSAT NEWS SERVICE BULLETIN 008.03 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 8, 1993
TO ALL RADIO AMATEURS BT
BID: $ANS-008.03

Next SAREX Mission: STS-60

The STS-60 flight of the Space Shuttle Discovery represents the next Shuttle Amateur Radio Experiment (SAREX) mission. STS-60 is currently scheduled for launch on February 3, 1994 at 12:10 UTC. The primary payloads on-board STS-60 are the Wake Shield Facility and the second flight of the Spacehab, a pressurized module installed in the forward section of the Orbiter. The Spacehab science objectives are primarily micro-gravity oriented with emphasis on materials and life science.

The flight of STS-60 represents an historic first---the first joint U.S.-Russian Space Shuttle flight. This will be the first of several joint missions planned in preparation for the development of the international Space Station. Cosmonaut Sergei Krikalev, U5MIR, was chosen to be the first Russian to fly on the U.S. Space Shuttle. During the 8 day flight, Cosmonaut Krikalev will support the science operations on the Space Shuttle as Mission Specialist 4.

The SAREX operations on this flight include voice and packet. Preliminary discussions between the astronauts and the SAREX working group indicate that the Shuttle crew will be extremely busy with the numerous payloads on this flight. This information is being provided so the amateur community is aware that voice operations might be rare on this flight. Packet radio operations are expected when the crew is not engaged in voice operations. Please remember that this is a preflight prediction. The astronauts and the SAREX working group cannot guarantee this prediction. The following information sheet gives more details on SAREX operations for STS-60.

STS-60 Shuttle Amateur Radio Experiment (SAREX)
Information Sheet

Mission:STS-60 Space Shuttle Discovery
Wake Shield Facility & Spacehab-2 Mission

Launch: February 3, 1994, 12:10 UTC

Orbit: 57 degree inclination

Mission Length:8 days (Nominal)

Amateur Radio Operators: Charlie Bolden (License Pending), Ron Sega
(License Pending), Sergei Krikalev, U5MIR

Modes:FM Voice
Prime callsign: To be provided once Commander Bolden's callsign is known

Packet Radio: Callsign W5RRR-1

Frequencies: All operations in split mode. Do not transmit on
the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks: 144.91, 144.93, 144.95, 144.97,
144.99 MHz (Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: The crew will not favor any specific uplink frequency, so your ability to
work the crew will be the "luck of the draw."

Packet Freqs: Downlink: 145.55 MHz
Uplink: 144.49 MHz

Info: Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland,
SAREX Bulletins and Shuttle Retransmissions
3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz
and 147.45 MHz (FM)

Johnson Space Center ARC, W5RRR, Houston, Texas
SAREX Bulletins 7225 KHz, 14,280 KHz, 21,395 KHz, 28,650 KHz, (SSB)
and 146.64 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT
SAREX News Bulletins: 3990, 7290, 14,290, 18,160, 21,390,
and 28,590 KHz and 147.555 MHz (FM)

Also, bulletins available on internet, via AMSAT ANS, Compuserve,
and your local PBSS.

School Group Participation: 5 school groups will participate in SAREX with
pre-scheduled direct and telebridge contacts.
These include 4 in the U.S., and one in Russia.

Prelaunch Keplerian Elements: The following Keplerian Elements are provided by
Gil Carman (WA5NOM) at the Johnson Space Center
ARC:

Satellite: STS-58
Catalog number: 00058
Epoch time: 94024.67747791 = (24-JAN-94 16:15:34.09 UTC)
Element set: 005

Inclination: 39.0114 deg
RA of node: 124.6663 deg Space Shuttle Flight STS-58
Eccentricity: .0007676 Prelaunch Element set JSC-005
Arg of perigee: 272.4217 deg Launch: 24-JAN-94 14:53 UTC
Mean anomaly: 87.5676 deg
Mean motion: 15.96123499 rev/day Gil Carman, WA5NOM
Decay rate: 1.19475e-03 rev/day*2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 329

[The AMSAT News Service (ANS) would like to thank Frank Bauer (KA3HDO) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-008.04
AO-13 TRANSPONDER SCHEDULES

HR AMSAT NEWS SERVICE BULLETIN 008.04 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 8, 1993
TO ALL RADIO AMATEURS BT
BID: $ANS-008.04

G3RUH Provides AO-13 "Provisional" Transponder Operating Schedules For '94

The AO-13 Ground Command Station of G3RUH has provided the "best guess" transponder schedules for the first half of '94. Please take the following schedules and paste them in a prominent place in your station.

AO-13 Provisional Mode Schedules 1994

L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jan 31-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04

L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 04-Jul 11
Mode-B : MA 0 to MA 160 | OFF
Mode-B : MA 160 to MA 220 |
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 240/0
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 160 | Move to attitude 180/0, Jul 11

G3RUH also has provided a table to indicate what the Bahn longititude and latitude for AO-13 will be in the upcoming year. Again, this information should be considered as the "best guess" and placed in a prominent place in your ham shack.

AO-13 Provisional Attitude Schedule 1994-5
==========

Date [Mon] Blon Blat SA to SA Weeks Notes

1994 Jan 31 180 0 -36 35 9
1994 Apr 04 240 0 -2 29 14
1994 Jul 11 180 0 36 -33 9
1994 Sep 12 230 0 0 -26 14 < Up to 132 minute eclipses
1994 Dec 19 180 0 -34 33 9 MA 96-107 Oct 22 - Nov 07
1995 Feb 20 230 0 12 21 14
1995 May 29 180 0 30 -31 8
1995 Jul 24 230 0 -10 -22 15 < Up to 132 minute eclipses
1995 Nov 06 180 0 -30 34 8 MA 96-103 Sep 05 - Sep 21
1996 Jan 01 230 0 9 -- --

Note: SA stands for "Sun Angle"

Unfortunately, because AO-13's perigee height has decreased from 1500 KM to 420 KM, G3RUH is unsure about whether AO-13 will still be in orbit by the end of '95 and into early '96. But if AO-13 has not re-entered into the earth's atmosphere, the above Bahn longitiude and latitude values will be the planned values.

[The AMSAT News Service (ANS) would like to thank G3RUH for this bulletin item. G3RUH can be reached at G3RUH @GB7DDX.#22.GBR.EU]

/EX
SB SAT @ AMSAT $ANS-008.05
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 008.05 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 8, 1993
TO ALL RADIO AMATEURS BT
BID: $ANS-008.05

Weekly OSCAR Status Reports: 08-JAN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1993 Dec 27-Jan 31
Mode-B : MA 0 to MA 180 | OFF
Mode-B : MA 180 to MA 220 |
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 240/-5
Mode-B : MA 250 to MA 256 | OFF
Omnis : MA 250 to MA 150 | Move to attitude 180/0, 31-Jan-94
Poor Sun angle and battery testing need maximum OFF time.
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current FO-20 operating schedule:
From January '94 thru February '94, the analog mode and the
digital mode will be on alternately for a week at a time.
ANALOG MODE:
12-JAN-94 7:30 -TO- 19-JAN-94 7:50 UTC

26-JAN-94 8:20 -TO- 02-FEB-94 6:50 UTC
09-FEB-94 7:15 -TO- 16-FEB-94 7:40 UTC
DIGITAL MODE: Unless otherwise noted above. [JJ1WTK]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Up and running. Busy as usual. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

31. SARSAT data decoding?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-10 14:13:03 UTC
From: bennettj@world.std.com
Message-ID: <CJF3Hs.4Mw@world.std.com>
Source record: 28285

I work with search and rescue and track the SARSAT satellites, NOAA 9, 10 & 11 and Nadezhda 1, 2 & 3.
When 'on a mission' I receive details of satellite 'hits' from the Air Force Rescue Cooridination Center. I would like to experiment with receiving and decoding the 'hit' data directly.
Do you know how this is done, what format the data is in, and what downlink frequencies are used for the sarsat data?
The weather portion of the data is well documented but I cannot find anything on the ELT part.
--
John Bennett, P.E. 617-275-1356, Fax: 617-271-0605. KD1CO

32. * SpaceNews 10-Jan-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-01-10 15:42:56 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0110.1994@ampr.org>
Source record: 28292
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

```
SB NEWS @ AMSAT $SPC0110
* SpaceNews 10-Jan-94 *

BID: $SPC0110

=========
SpaceNews
=========

MONDAY JANUARY 10, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* AO-16 NEWS *
==============
Recommended Operation Procedure to Reduce AO-16 Uplink Contention:

1993 has brought many new satellites and many new satellite users. It
would be good to dust off an old AMSAT bulletin from 1991 to help refresh
the "old-timers" procedures and to aquaint new users to the recommended
uplink frequency usage.

The AO-16 Command Team recommends that users of the AO-16 PBBS system
use only uplink channel D (145.960 MHz) for download and directory requests
leaving channels A, B, and C (145.900, 145.920, and 145.940 MHz) for file
uploads and digi users.

Stations uploading files should stay off of the download/directory/fill
request channel D as their longer uplink packets will collide with the
shorter request packets. Stations doing downloads and directories should
stay off channels A, B, and C since their frequent but short requests will
collide with longer uplink attempts seriously degrading uplink performance.
Another benefit of using this procedure, while most of the uplink activity
to AO-16 will be on channel D (145.960) this frequency is high enough in the
passband of AO-13 that QRMing our fellow operators will be kept to a minumum
when Pacsat crosses beneath AO-13's path.

Recommended AO-16 operating practice in summary:

Downlinks: 437.050 (also 2400.143 on experimenter's day.)
Uplinks: 145.900 A uploads
145.920 B uploads
145.940 C uploads
145.960 D downloads, fills and directory requests

[Info via WJ9F, AO-16 Command Team Leader]
```

* NASA TV MOVED *
==========
NASA Select Television has moved to Spacenet 2, transponder 5, C band,
69 degrees west longitude, 3880.0 MHz, horizontal polarization, with audio
on a 6.8 MHz subcarrier. NASA Select offers daily educational and
information programming, carries shuttle launches and mission coverage,
and occasionally airs live coverage of Shuttle Amateur Radio Experiment
activity. The move occurred on 08-Jan-93 at 1500 UTC.

[Info via ARRL]

* NEW MIR CREW *
==========
By Serge Samburov, RV3DR

Launch: 08.01.94 aboard SOYUZ-TM18 (crew #15)
Docked at the port of "MIR" 10.01.94
Undocked and launched to Earth cosmonauts V. V. Ziblyiv
and A. A. Serebrov (crew #14) 14.01.94 aboard Soyuz TM17

Crew #15:
Viktor Afanasiev (commander) HAM #30, call U9MIR
Yuri Usachev (flight engineer) HAM #31, call R3MIR
Valerij Polyakov (doctor) HAM #32, call U3MIR
Call packet: R0MIR
Call PMS "MIR": R0MIR-1
Call voice U3MIR, U9MIR, R3MIR, R0MIR op. Viktor, Valerij, Yuri

==========
CALL NAME # CREW FLIGHT TIME
==========
30 U9MIR VIKTOR AFANASIEV 15 08.01.94-04.07.94
31 R3MIR YURI USACHEV 15 08.01.94-04.07.94
32 U3MIR VALERIJ POLYAKOV 15/16/17 08.01.94-april 95

Starting 01.01.93 the new QSL Manager for cosmonauts is RV3DR.
I also confirm all QSOs with station MIR from 1988.

RV3DR-Serge Samburov, Space "MIR" QSL Manager
Chief of Cosmonaut Amateur Radio Department NPO "Energia"

All QSLs should be sent to:
P.O.BOX 73, Kaliningrad-10 city, Moscow Area, 141070, RUSSIA.

Send me message via PKT: RV3DR#R#MIR or RV3DR@RK3KP.#MSK.RUS.EU

Happy QSQ BEST 73 ***RV3DR***

[Info via N2NRD]

* GST UPDATE FOR 1994 *
==========
For those tracking satellites with BASIC programs that require sideral
time constants, here is the Greenwich Sidereal Time (GST) for January 0,
1994:

G2 = 0.2761908

You will need to replace this value in your program for element sets
having Epoch years of 1994 and later. Don't forget that you can just use
a date of 13/01/93, 13/02/93, ... until you get 1994 element sets.

[Info via Dick, N3FKV]

* FO-20 OPERATION SCHEDULE *
============================
The following is the current operating schedule for FO-20:

ANALOG MODE:

12-Jan-94 7:30 -to- 19-Jan-94 7:50 UTC
26-Jan-94 8:20 -to- 02-Feb-94 6:50 UTC
09-Feb-94 7:15 -to- 16-Feb-94 7:40 UTC

The digital (Mode JD) transponder is available at all other times.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
===========
Thanks to all those who sent messages of appreciation regarding SpaceNews,
especially:

FB1RCI XE1KK VU2LBW VK3ZMF XX9AS Frank L. Weissferdt

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

33. Ten-Tec 2510B for sale

Newsgroup: rec.radio.amateur.space
Date: 1994-01-10 16:00:48 UTC
From: tavernin@sun1.interlan.com
Message-ID: <CJF8HD.D4@rd1.InterLan.COM>
Source record: 28286

I have a mint Ten-Tec 2510B for sale, this unit was factory modified
to cover AO-13.

Comes with manual and a Ten-Tec 700C hand mike.

The best offer gets it ...

Reason for selling ... new QTH is in direct flight path of major
metropolitan airport :-(Plus my renewed interest in RS-10/11 and
RS-12/13 :-)

Thanks,

Victor Tavernini
Racal-Datacom, Inc.

tavernin@sun1.interlan.com

34. TrakBox panel layout files

Newsgroup: rec.radio.amateur.space
Date: 1994-01-11 05:09:04 UTC
From: fmitch@netcom.com
Message-ID: <fmitchCJG8z5.KJz@netcom.com>
Source record: 28287

hi, mitch wa4osr here in mobile, alabama...

the trakbox panel layout is complete... i have posted the file to
ucsd.edu in the \hamradio\packet\tcpip\incoming directory...
the filename is trakbox.zip...

the file contains the corel draw 3 and .gif files of the front
and rear panels, design page, layout page, and mirror images...

mitch
--
---
fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR in Mobile, Alabama USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..
---

35. APT-Satellites: Report JAN 09, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-01-11 08:21:11 UTC
From: peter.henne@gmd.de
Message-ID: <1994Jan11.082111.3736@gmd.de>
Source record: 28288
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, JAN 09, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)
Meteor 3-5: APT 137.30 On

Meteor 3-5 passes morning ascending, Meteor 2-21 afternoon
ascending. This results in bad illumination when over higher
northern latitudes. No IR-transmissions from both Meteor's.
Vis-images of all NOAA's are very dim now too when transmitted
from higher northern latitudes, ch2-ch3-switching takes place
at around 60 deg NLat.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-5205 St.AUGUSTIN 1 |
|Fed.Rep. of Germany |
+----------------------------------------+
```

36. Re: Keplerian data for moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-11 13:56:37 UTC
From: ae517@FreeNet.Carleton.CA
Message-ID: <CJGxEE.MEo@freenet.carleton.ca>
Source record: 28289

In a previous article, danny_kohn@sm0nbj.ct.se (Danny Kohn) says:

>I really don't think that there are any keplerian data for the moon. There is
>some software availbale for moon tracking though.
>
>H{lsningar
>Danny
>
MOON
1 0002 93360.0000000 0.0000000 00000-0 00011
2 0002 22.4297 346.9573 .040813 180.3337 265.5319 0.035749304251

I can not vouch for the long-term accuracy of these keps, as I merely
pulled them off the local packet bbs. The two times I have plugged them
into to mactrak, it seem to work, ie the software predicted that the moon was
visible, and lo and behold, that great orb in the sky was actually there!

amusez-vous bien!

de Russ
VA3RR/AA8LU
in beautiful downtown Ottawa

*** I survived the Beijing flu!! ***

--

37. Re: TrakBox panel layout files

Newsgroup: rec.radio.amateur.space
Date: 1994-01-11 14:57:14 UTC
From: fmitch@netcom.com
Message-ID: <fmitchCJH07E.FAE@netcom.com>
Source record: 28290

Felton Mitchell (fmitch@netcom.com) wrote:
: hi, mitch wa4osr here in mobile, alabama...

: the trakbox panel layout is complete... i have posted the file to
: ucsd.edu in the \hamradio\packet\tcpip\incoming directory...
: the filename is trakbox.zip...

: the file contains the corel draw 3 and .gif files of the front
: and rear panels, design page, layout page, and mirror images...

: mitch

now also available on world.std.com \pub\hamradio\pc\digital

mitch

--
---
fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR in Mobile, Alabama USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..
---

38. what are the rules for retransmitting NASA select?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-11 16:36:09 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <2gukhpINNr5f@newsstand.cit.cornell.edu>
Source record: 28291

Hi,

Our club is interested in making NASA select video
of upcoming shuttle missions available to hams
via the local ATV repeater. We've got a station
with a satellite dish who can get the signal
direct, and we have him equipped with an ATV
station now, but we need some specific info on
the related rules. (we're also thinking of putting
the audio on the local 440 repeater - trying to
have a UHF appreciation week to get the activity
levels up)

What we think we know is this. We *think* its legal
to retransmit any of the SAREX missions and that
NASA has given blanket permission for these
retransmissions to occur.

We don't know if it is ok to retransmit shuttle
coverage of non-sarex missions.

We don't know if we need specific permission from
NASA to do anything. (we might call and get it
anyway just to be sure)

We don't know if we can retransmit tapes of past
missions (such as highlights of the last mission
with Hubble).

We've all scrounged around to see what we have for
rulebooks and the best is 1992 so far. And we don't know
what rules affecting this might have changed with the
recent rewrite of part 97. In reading that, it seems
that since it's not prohibited, we can go do it. Just
like to do a little checking beyond that.

Any help or useful comments appreciated.

Thanks,

Kevin, WB2EMS

39. JVFAX interface

Newsgroup: rec.radio.amateur.space
Date: 1994-01-12 10:27:02 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CJIID2.487@bbc.co.uk>
Source record: 28293

I have the circuit diagram for the JVFAX interface. If anyone has a PCB layout could they please Email me.

Regards John B

John.boyer@rd.eng.bbc.co.uk

40. help FT790 MK2 tunnig step in FM mode

Newsgroup: rec.radio.amateur.space
Date: 1994-01-12 11:17:46 UTC
From: s2301190@techst02.technion.ac.il
Message-ID: <CJIKpM.BEw@discus.technion.ac.il>
Source record: 28294

Hi,
I'm looking for a modification to the FT790 MK2 tunnig step in FM mode.
The current 20,10,5 Khz steps are just to coarse for doppler correction
while working with the PACSATs. if you know of such modification PSE let
me know.

Thank you and 73 de Yoram 4z9dea.

41. Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-12 15:21:39 UTC
From: markm@bigfoot.sps.mot.com
Message-ID: <1994Jan12.152139.4893@newsgate.sps.mot.com>
Source record: 28305
Cross-posted to: sci.electronics,rec.radio.amateur.space

I recently came across an article in another newsgroup that quoted a NASA report about the Mars Observer disappearance and one item caught my attention:

>> ... Mars Observer had turned off its transmitter as a
>> precautionary measure to protect the transmitter tubes from shock
>> just before it pressurized its onboard propellant tanks on August
>> 21. ...

Do they use vacuum tubes in spacecraft transmitters? I understand that tubes are more radiation-resistant than semiconductors, that they would be in a near-perfect vacuum in space, etc., but I'm still surprised. Does anyone have any info on this?

Enquiring minds want to know.

Thanks.

Mark

42. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-12 22:16:19 UTC
From: jfw@ksr.com
Message-ID: <38484@ksr.com>
Source record: 28296
Cross-posted to: sci.electronics,rec.radio.amateur.space

markm@bigfoot.sps.mot.com (Mark Monninger) writes:
>I recently came across an article in another newsgroup that quoted a NASA
>report about the Mars Observer disappearance and one item caught my attention:
>>> ... Mars Observer had turned off its transmitter as a
>>> precautionary measure to protect the transmitter tubes from shock
>>> just before it pressurized its onboard propellant tanks on August
>>> 21. ...
>Do they use vacuum tubes in spacecraft transmitters? I understand that tubes
>are more radiation-resistant than semiconductors, that they would be in a
>near-perfect vacuum in space, etc., but I'm still surprised. Does anyone have
>any info on this?

They used tubes because at the time they designed it, vacuum tubes that could provide the needed power output at microwave frequencies were cheaper and more reliable than comparable semiconductors. In fact, power microwave semiconductors are still kind of expensive, at least in small quantities.

43. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-12 22:27:11 UTC
From: jbenham@etgn10.rtp.dg.com
Message-ID: <1994Jan12.222711.28434@webo.dg.com>
Source record: 28295
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan12.152139.4893@newsgate.sps.mot.com>,
markm@bigfoot.sps.mot.com (Mark Monninger) writes:
> I recently came across an article in another newsgroup that quoted a NASA
> report about the Mars Observer disappearance and one item caught my
attention:
>
> >> ... Mars Observer had turned off its transmitter as a
> >> precautionary measure to protect the transmitter tubes from shock
> >> just before it pressurized its onboard propellant tanks on August
> >> 21. ...
>
> Do they use vacuum tubes in spacecraft transmitters? I understand that
tubes
> are more radiation-resistant than semiconductors, that they would be in a
> near-perfect vacuum in space, etc., but I'm still surprised. Does
anyone have
> any info on this?
>
> Enquiring minds want to know.
>
> Thanks.
>
> Mark

I believe they still use TWTs because of their superior frequency/output
power rating - I guess vacuum
devices still cant be beat for some applications - I'll bet you probably
have one in front of you right now :)

44. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-13 02:23:25 UTC
From: wa2ise@netcom.com
Message-ID: <wa2iseCJJqn2.G81@netcom.com>
Source record: 28297
Cross-posted to: sci.electronics,rec.radio.amateur.space

Well, once it's out in space, it wouldn't need the glass envelope anymore.

45. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-13 07:18:33 UTC
From: whit@u.washington.edu
Message-ID: <2h2sk9$s28@news.u.washington.edu>
Source record: 28298
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <38484@ksr.com>, John F. Woods <jfw@ksr.com> wrote:
>markm@bigfoot.sps.mot.com (Mark Monninger) writes:
>>>> ... Mars Observer had turned off its transmitter as a
>>>> precautionary measure to protect the transmitter tubes from shock
>>Do they use vacuum tubes in spacecraft transmitters? I understand that tubes
>>are more radiation-resistant than semiconductors

>They used tubes because at the time they designed it, vacuum tubes that could
>provide the needed power output at microwave frequencies were cheaper and more
>reliable than comparable semiconductors. In fact, power microwave
>semiconductors are still kind of expensive, at least in small quantities.

I don't think expense was the reason. It was radiation hardness,
primarily (and vacuum tubes are a LOT more reliable in space than
semiconductors, so you wouldn't have to use as many backups).

I recall one of the Voyager spacecraft had to be operated
with the power to the onboard computer REVERSED for a period, in order
to correct some radiation-induced degradation. Yes, that's right:
they hooked up the computer to the wrong polarity of power, deliberately.

John Whitmore

46. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-13 16:06:47 UTC
From: rdavis@nyx10.cs.du.edu
Message-ID: <1994Jan13.160647.10468@mnemosyne.cs.du.edu>
Source record: 28299
Cross-posted to: sci.electronics,rec.radio.amateur.space

I dunno where I read the information about vacuum tubes, but yes,
I have read that NASA uses tubes for exactly the reasons you specify.
Tubes are resistant to the various forms of radiation in space.
And tubes do not need envelopes ... the vacuum of space is better
than the vacuum in any vacuum tube ever used on Earth.
====
Still, I think that not enclosing the tubes in something is kind of
dumb 'cause any gases vented by the spacecraft will continue to travel
along with the spacecraft and degrade the vacuum around the tubes.

47. Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-13 16:13:38 UTC
From: jangus@skyld.tele.com
Message-ID: <758477618snx@skyld.tele.com>
Source record: 28300

In article <1994Jan12.152139.4893@newsgate.sps.mot.com> rapw20@email.sps.mot.com writes:

> Do they use vacuum tubes in spacecraft transmitters? I understand that tubes
> are more radiation-resistant than semiconductors, that they would be in a
> near-perfect vacuum in space, etc., but I'm still surprised. Does anyone have > any info on this?

They're called traveling wave tubes (twt) that's the best way of generating
power at microwave frequencies. Varian and Hughes Aircraft make most of them.

Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA | "It is difficult to imagine our
Internet: jangus@skyld.tele.com | universe run by a single omni-
US Mail: PO Box 4425 Carson, CA 90749 | potent god. I see it more as a
Phone: 1 (310) 324-6080 | badly run corporation."

48. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-13 17:58:37 UTC
From: breivog@ornews.intel.com
Message-ID: <2h424u$fc3@ornews.intel.com>
Source record: 28302
Cross-posted to: sci.electronics,rec.radio.amateur.space

rdavis@nyx10.cs.du.edu (Robert Davis) writes:

>I dunno where I read the information about vacuum tubes, but yes,
>I have read that NASA uses tubes for exactly the reasons you specify.
>Tubes are resistant to the various forms of radiation in space.
>And tubes do not need envelopes ... the vacuum of space is better
>than the vacuum in any vacuum tube ever used on Earth.

Vacuum tubes used in spacecraft still use envelopes. Since testing is required
on the ground, the tubes would be non-functional!

Also, radiation hardness is a minor concern, otherwise tubes would also
be used in the onboard computers!

The primary tube that is still used is the TWT, or Traveling Wave Tube. It
is used for high power, higher frequency microwave amplifiers. I believe
that communications satellites widely use them.

>====
>Still, I think that not enclosing the tubes in something is kind of
>dumb 'cause any gases vented by the spacecraft will continue to travel
>along with the spacecraft and degrade the vacuum around the tubes.

49. Re: Traksat 3.00!

Newsgroup: rec.radio.amateur.space
Date: 1994-01-13 21:09:20 UTC
From: kwi@snakemail.hut.fi
Message-ID: <KWI.94Jan13230920@beta.hut.fi>
Source record: 28301

In article <1f.174.1818.0NC5BAD3@compart.fi> leo.wikholm@compart.fi (Leo Wikholm) writes:

A new version of TRAKSAT is now available to registered users.

Where I can get it?

Kaj OH6EH/2

50. Daily IPS Report - 13 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-14 08:05:20 UTC
From: dave@eram.esi.com.au
Message-ID: <2h5jo0$a0@news.ysu.edu>
Source record: 28357
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 12 January 1994
Summary for 12 January and Forecast up to 15 January
IPS Warning 01 was issued on 11 Jan and is still current.
------------------------------------------------------------

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 098/045

1B. SOLAR FORECAST
13 January 14 January 15 January
Activity Very low Very low Low to moderate
Fadeouts None expected None expected Possible

Forecast 10.7 cm flux/Equivalent Sunspot Number : 095/041

1C. SOLAR COMMENT
None.
------------------------------------------------------------

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled to active

Estimated Indices : A K Observed A Index 11 January
Learmonth 19 4333 4433
Fredericksburg 18 16
Planetary 20 15

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
13 Jan 20 Unsettled to active.
14 Jan 15 Unsettled.
15 Jan 10 Quiet to unsettled.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
12 Jan normal normal fair-normal
PCA Event : None.
```

3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
13 Jan normal fair poor
14 Jan normal normal fair
15 Jan normal normal fair
3C. GLOBAL HF PROPAGATION COMMENT
None.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values

T index: 30

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
13 Jan 60 Up to 15% enhanced.
14 Jan 50 Up to 15% enhanced.
15 Jan 50 Up to 15% enhanced.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Sporadic E layer was present for most of the 12th.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2RWI.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

--
Rick "RD" Baker (xx159@yfn.ysu.edu) | "Happiness is a Band Opening"
SWL Sig Sysop | Wily E. Coyote (famous inventor)
Youngstown Free Net |

51. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-14 16:04:30 UTC
From: eck001@email.mot.com
Message-ID: <1994Jan14.160430.16810@lmpsbbs.comm.mot.com>
Source record: 28307
Cross-posted to: sci.electronics,rec.radio.amateur.space

At least as of a couple years ago...
Several shuttle onboard computers made by IBM use magnetic core memory
("beads and string") which limits the range of windspeeds that can be
accomodated at liftoff.

But is anyone suprised that 1960s technology is used on the shuttle;
I'd hate to guess at how much of the design is on Hollerith cards.

In article <2h424u$fc3@ornews.intel.com>, breivog@ornews.intel.com (Bob Breivogel) writes:
>
> rdavis@nyx10.cs.du.edu (Robert Davis) writes:
>
>
> >I dunno where I read the information about vacuum tubes, but yes,
> >I have read that NASA uses tubes for exactly the reasons you specify.
> >Tubes are resistant to the various forms of radiation in space.
> >And tubes do not need envelopes ... the vacuum of space is better
> >than the vacuum in any vacuum tube ever used on Earth.
>
> Vacuum tubes used in spacecraft still use envelopes. Since testing is required
> on the ground, the tubes would be non-functional!
>
> Also, radiation hardness is a minor concern, otherwise tubes would also
> be used in the onboard computers!
>
> The primary tube that is still used is the TWT, or Traveling Wave Tube. It
> is used for high power, higher frequency microwave amplifiers. I believe
> that communications satellites widely use them.
>
>
>
>
>
> >====
> >Still, I think that not enclosing the tubes in something is kind of
> >dumb 'cause any gases vented by the spacecraft will continue to travel
> >along with the spacecraft and degrade the vacuum around the tubes.
>
>
>

52. Re: help FT790 MK2 tunnig step in FM mode

Newsgroup: rec.radio.amateur.space
Date: 1994-01-14 16:12:28 UTC
From: P11163@email.mot.com
Message-ID: <1994Jan14.161228.5699@schbbs.mot.com>
Source record: 28304

In article <CJIKpM.BEw@discus.technion.ac.il>, s2301190@techst02.technion.ac.il (Yoram Rotbach) says:
>
>Hi,
>I'm looking for a modification to the FT790 MK2 tunnig step in FM mode.
>The current 20,10,5 Khz steps are just to coarse for doppler correction
>while working with the PACSATs. if you know of such modification PSE let
>me know.
>
>Thank you and 73 de Yoram 4z9dea.
>
I use a FT790R on all the digital ham satellites with no tuning problems. The method that I use for tuning the 9600 baud birds in FM (UO-22, KITSAT,...) is to program into one of the channel memories the center frequency of the bird. For sat freqs that are not on the channel spacing that is available for tuning in the FM mode, I put the radio in the USB mode and tune in the proper channel frequency and then program the frequency into the channel memory. The channel memory (at least on my FT790R, maybe not so in your MK2...not sure) does not control the radio mode. You can then select the center frequency for the 9600 baud bird by selecting the proper memory channel, select the mode by the mode control knob and then do doppler correction by enabling the clarifier which will allow you to tune up and down 10 KHz from the channel memory frequency. The maximum doppler frequency shift that you would ever see on Mode J (435 MHz down) would be 9.8 KHz maximum. I use a TRAKBOX satellite control unit that is made here in the states which allows both rotor and radio frequency tuning control. It provides an up/down frequency control option to center satellite signals in the downlink reciever IF for optimum signal detection. My FT790R using the clarifier to provide incremental frequency control works perfectly with TRAKBOX for me. I hope this helps. Let me know if you have any questions about what I've described here.

Good luck.
Ned Stearns AA7A

53. polarization program

Newsgroup: rec.radio.amateur.space
Date: 1994-01-14 16:58:37 UTC
From: steve@NETSYS.COM
Message-ID: <steve.758566717@netsys.com>
Source record: 28303

Does anyone know of any software that calculates the polarization angle
for receiving stations for geo. satellites?

Thanks, please email direct.

Steve Eigsti

54. * SpaceNews 17-Jan-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-01-14 19:28:04 UTC
From: kd2bd@ka2qhd.DE.COM
Message-ID: <$spc0177.1994@ampr.org>
Source record: 28335
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB NEWS @ AMSAT $SPC0117
* SpaceNews 17-Jan-94 *

BID: $SPC0117

=========
SpaceNews
=========

MONDAY JANUARY 17, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* SUN AND MOON KEPS *
====================
By popular demand, here are Keplerian element sets in the NASA 2-line
format that will allow some satellite tracking programs to track the sun
and moon:

SUN
1 00001U 90 1.00000000 0.00000000 00000-0 0 3
2 00001 23.4406 0.0000 0167133 282.7685 357.6205 0.00273778 19890
MOON
1 00002U 93360.00000000 0.00000000 00000-0 0 5
2 00002 22.4297 346.9573 0408130 180.3337 265.5319 0.03574900304251

Caution should be exercised when using these element sets for several
reasons. First of all, these elements will cause some programs to crash
or produce erroneous outputs due to the unusually low values of mean motion
(and correspondingly high values of semi-major axis). Secondly, satellite
tracking software ignores satellite mass since their mass is negligible when
compared with the Earth's mass. The situation is not as simple when
tracking massive objects such as the sun or moon. In addition, the rising
and setting times for the sun and moon are defined by edge of the visible
disk, whereas the elements presented above track the center of the disk.
Effects due to atmospheric refraction could result in additional errors in
the prediction of local rising and setting times.

* STS-58 ORBITAL DATA *
======================
The following Keplerian orbital data set is valid for an on-time launch
of 24-Jan-94 at 14:53 UTC:

Satellite: STS-58
Catalog number: 00058
```

Epoch time: 94024.67747791 = (24-JAN-94 16:15:34.09 UTC)
Element set: 005
Inclination: 39.0114 deg
RA of node: 124.6663 deg Space Shuttle Flight STS-58
Eccentricity: .0007676 Prelaunch Element set JSC-005
Arg of perigee: 272.4217 deg Launch: 24-JAN-94 14:53 UTC
Mean anomaly: 87.5676 deg
Mean motion: 15.96123499 rev/day Gil Carman, WA5NOM
Decay rate: 1.19475e-03 rev/day*2 NASA Johnson Space Center
Epoch rev: 2

[Info via Gary Morris, KK6YB]

* SUPERBALL HAS THREE-HOUR LIFE *
==========
Some days go better than others. Superball 1-94, the balloon carrying amateur radio telemetry and ATV had a life of about three hours. Here is a report for those who were following the event.

Launch took place Friday, January 7, at 0926 MST (1626z). Final payload checkout was done, the amount of helium required for 120,000 feet was metered in, and the launch took place with all systems looking good. The balloon headed northeast as expected. Telemetry was copied on both 2 and 15 meters, and ATV sent back video of the balloon.

The balloon began to change course, as expected, as it came out of the Troposphere and reached higher layers. At about 1204 MST (1804 UTC) the balloon unexpectedly burst. A quick drop in the differential pressure (difference between inside and outside pressures) from 1.11 to 0.03 was one of the first clues that something had changed radically. Hams in eastern Utah actually watched the rupture on ATV and later saw the parachute deploy. GPS readings stabilized at about 1430 MST (2130z), and the package is believed to have come to rest at that time.

Telemetry on 15 meters was copied in Ohio with an RST of 579 after the package came to rest. This leads to the inference that it probably landed in a tree with the 15-meter antenna in a favorable position. The landing site is in Utah's Uinta Mountains in the neighborhood of Wolf Creek Summit, a 9500-foot pass. Plans were made to locate and retrieve the payload with the help of snowmobiles and the Wasatch County Search and Rescue Team.

The reason for the rupture is still uncertain, but one possibility is that turbulence in the troposphere caused severe twisting and kept the balloon from unfurling properly as it gained altitude. This, in turn, kept the helium from spreading through the balloon properly and resulted in too high a differential pressure. The twisting phenomenon was viewed on ATV.

The GPS receiver performed well reporting latitude and longitude, but apparently satellite geometry was not favorable for good altitude readings. The initial altitude readings were spurious (e.g. 149 meters, which is below ground level in Utah). Later the altitude was reported as "999" which is the receiver's indication that good data is not available. Other

indications, however, lead the team to believe that the balloon had reached an altitude of about 100,000 feet at the time of rupture.

Thanks to the many who helped copy data, relay messages, locate snowmobiles, and record launch and ATV video.

Telemetry logs and video tapes are solicited. E-mail to: WB7QBC@uugate.aim.utah.edu, or or U.S. mail to:

John Luker, WB7QBC
1226 West 725 North
Clearfield, UT, 84015

* FO-20 OPERATION SCHEDULE *
==========
The FO-20 operation schedule is follows. Analog transponder and digital transponder will be ON for a week respectively as they were since last December.

Analog mode:
12-Jan-94 07:30 UTC -to- 19-Jan-94 07:50 UTC
26-Jan-94 08:20 UTC -to- 02-Feb-94 06:50 UTC
09-Feb-94 07:15 UTC -to- 16-Feb-94 07:40 UTC
23-Feb-94 08:05 UTC -to- 02-Mar-94 06:40 UTC
09-Mar-94 07:05 UTC -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 UTC -to- 30-Mar-94 08:15 UTC

Digital mode:
Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* MIR NEWS *
==========
On Dec 31, 1993, the following digital voice message was sent my Mir on 145.550 MHz FM:

"There are two men in space. This is crew fourteen of Russian Mir Space Station: Vasily Zibliev and Aleksandr Serebrov. And now orbiting the Earth. We send our wishes of Happy New Year, peace, good health and prosperity to people of all countries and all nations of our planet."

[Info via Markku, OH8UV]

* CORRECTION *
==========
NASA TV has moved to Spacenet 2, transponder 9, not 5 as reported last week. Thanks to Dave Larson for the correction.

* THANKS! *
==========
Thanks to all those who sent messages of appreciation regarding SpaceNews, especially:

Kit Richards Donald Scott G7MIZ

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

55. DO-17 SWL?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-14 19:46:40 UTC
From: tavernin@sun1.interlan.com
Message-ID: <CJMxLt.Fp2@rd1.InterLan.COM>
Source record: 28306

Does anybody know the SWL address for Dove 17? I know I could send
a message through the KO-23 gateway ... but since my license hasn't
arrived ...

Thanks,

Victor Tavernini
Racal-Datacom, Inc.

tavernin@sun1.interlan.com

56. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-15 02:06:30 UTC
From: mofo@netcom.com
Message-ID: <mofoCJnF6v.EyK@netcom.com>
Source record: 28308
Cross-posted to: sci.electronics,rec.radio.amateur.space

in article <1994Jan14.160430.16810@lmpsbbs.comm.mot.com> eck001@email.mot.com (Chris Kerlin) scribbles in crayon:
>At least as of a couple years ago...
>Several shuttle onboard computers made by IBM use magnetic core memory
>("beads and string") which limits the range of windspeeds that can be
>accomodated at liftoff.
>
>But is anyone suprised that 1960s technology is used on the shuttle;
>I'd hate to guess at how much of the design is on Hollerith cards.
>

i can vouch for that. i've seen the core sheets. i still have a vial of the raw core; looks like iron filings, theyre so small. ibm has a peculiar habit of taking an antiquated technology to the limit. look how much mileage they got out of their tso/mvs 60's era operating system. thats the one where you have to manually allocate disk tracks before saving a file. millions of corporate customers around the world think this is the state of the art in modern computer equipment, mostly because ibm says so.

d
--
mofo@netcom.com fold, mutilate, and spindle *this*

57. Re: Traksat 3.00!

Newsgroup: rec.radio.amateur.space
Date: 1994-01-15 06:59:36 UTC
From: prvalko@vela.acs.oakland.edu
Message-ID: <2h848o$2mo@oak.oakland.edu>
Source record: 28309

```
ftp to oak.oakland.edu it is in the msdos/satelite directory
```

58. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-01-15 12:10:40 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-758635834@unomaha.edu>
Source record: 28310
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

```
Posted-By: auto-faq 3.1.1.4
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info,
and rec.radio.swap newsgroups. It is intended to serve as a guide for the new
reader on what to find where. Questions and comments may be directed to the
author, Jay Maynard, K5ZC, by Internet electronic mail at
jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September
1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to
note the rmgroup of rec.radio.amateur.packet, and to officially retire some
(in)famous threads of discussion on rec.radio.amateur.policy.

History
=======

Way back when, before there was a Usenet, the Internet hosted a mailing list
for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions
were held on the mailing list, and sent to the mailboxes of those who had
signed up for it. When the Usenet software was created, and net news as we
now know it was developed, a newsgroup was created for hams: net.ham-radio.
The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began
to dominate other topics in the group and on the list. This resulted in the
logical solution: a group was created to hold the packet discussion, and
another corresponding mailing list was created as well: net.ham-radio.packet
and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great
Renaming essentially unchanged, moving from net.ham-radio[.packet] to
rec.ham-radio[.packet]. Readership and volume grew with the rest of the
network.

The INFO-HAMS mailing list was originally run from a US Army computer at
White Sands Missile Range, SIMTEL20. There were few problems with this
arrangement, but one was that the system was not supposed to be used for
commercial purposes. Since one of hams' favorite pastimes is swapping
gear, it was natural for hams to post messages about equipment for sale
to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use
restriction, and after some argument, a group was created specifically
```

for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
==========

Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

--
Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

59. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-15 17:35:44 UTC
From: devlin@lf.hp.com
Message-ID: <2h99hg$65k@hpavla.lf.hp.com>
Source record: 28311
Cross-posted to: sci.electronics,rec.radio.amateur.space

Chris Kerlin (eck001@email.mot.com) wrote:
: At least as of a couple years ago...
: Several shuttle onboard computers made by IBM use magnetic core memory
: ("beads and string") which limits the range of windspeeds that can be
: accomodated at liftoff.

: But is anyone suprised that 1960s technology is used on the shuttle;
: I'd hate to guess at how much of the design is on Hollerith cards.

Richard Feynman discussed this in his excellent book _What_Do_You_Care What_Other_People_Think_.

For those of you who don't know Feynman, he was the Nobel Prize-winning scientist that was part of the commission that investigated the Challenger accident. I was amazed to read that something as sophisticated as the shuttle would use something as antiquated as core memory. However, the shuttle's control software represents a large development investment and parts of it are borrowed from previous generation space programs. It also been thoroughly tested and therefore prohibitively expensive to change. That's why they're stuck with ancient hardware with which to run it.

--
Lee Devlin | HP Little Falls Site | phone: (302) 633-8697
| 2850 Centerville Rd. | email:
| Wilmington, DE 19808 | devlin@lf.hp.com

60. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-15 20:25:00 UTC
From: OSYSMAS@MVS.OAC.UCLA.EDU
Message-ID: <19940115202532OSYSMAS@MVS.OAC.UCLA.EDU>
Source record: 28313
Cross-posted to: sci.electronics,rec.radio.amateur.space

```
>: At least as of a couple years ago...
>: Several shuttle onboard computers made by IBM use magnetic core memory
>: ("beads and string") which limits the range of windspeeds that can be
>: accomodated at liftoff.
>
>: But is anyone suprised that 1960s technology is used on the shuttle;
>: I'd hate to guess at how much of the design is on Hollerith cards.
```

I remember reading somewhere that the original shuttle designers were given a choice by IBM. IBM said something like "we can use this existing, space rated hardware (core etc), or do a new design. The new design will take longer." The shuttle designers didn't want the shuttle delayed and told IBM that. So here we are -- even though other delays in the shuttle program added a few *years* to first shuttle flight.

61. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-15 21:29:16 UTC
From: myers@sunspot.West.Sun.COM
Message-ID: <2h9n7clNNd6m@abyss.West.Sun.COM>
Source record: 28312
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2h99hg$65k@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>Chris Kerlin (eck001@email.mot.com) wrote:
>: At least as of a couple years ago...
>: Several shuttle onboard computers made by IBM use magnetic core memory
>: ("beads and string") which limits the range of windspeeds that can be
>: accomodated at liftoff.
>
>: But is anyone suprised that 1960s technology is used on the shuttle;
>: I'd hate to guess at how much of the design is on Hollerith cards.
>
>Richard Feynman discussed this in his excellent book _What_Do_You_Care
>What_Other_People_Think_.
>
>For those of you who don't know Feynman, he was the Nobel Prize-winning
>scientist that was part of the commission that investigated the
>Challenger accident. I was amazed to read that something as
>sophisticated as the shuttle would use something as antiquated as core
>memory. However, the shuttle's control software represents a large
>development investment and parts of it are borrowed from previous
>generation space programs. It also been thoroughly tested and therefore
>prohibitively expensive to change. That's why they're stuck with ancient
>hardware with which to run it.

I'm sure none of us armchair designers would bother to consider that
core memory is considerably more immue to radiation induced errors
than semiconductor memory while we're re-designing the shuttle system,
which operate in a region of considerably higher ambient radiation
levels than on Earth...
--
* Dana H. Myers KK6JQ, DoD 466 | Views expressed here are *
* (310) 348-6043 | mine and do not necessarily *
* Dana.Myers@West.Sun.Com | reflect those of my employer *
* This Extra supports the abolition of the 13 and 20 WPM tests *

62. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 04:45:02 UTC
From: trier@odin.ins.cwru.edu
Message-ID: <2hagoe$gr7@usenet.INS.CWRU.Edu>
Source record: 28314
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2h9n7cINNd6m@abyss.west.sun.com>,
Dana Myers <myers@sunspot.West.Sun.COM> wrote:
>I'm sure none of us armchair designers would bother to consider that
>core memory is considerably more immue to radiation induced errors
>than semiconductor memory....

Yes, I was thinking about that. I remember reading, not six years ago, about _new_ core memory products designed to be used in automatically assembled PC boards, with simple TTL interfaces to microprocessors and all the other things we expect these days. They were fantastically expensive and invariably rated for military temperature ranges. Their intended use was radiation-hardened electronics.

I'm skeptical radiation is the reason behind core on the shuttle. I'm also not sure the shuttle still uses core. I've read that among the post-Challenger changes, the shuttles were equipped with modernized computers with substantially more memory. You tell me what that means (the popular press is never too specific). It could be it's just more core, or perhaps it has moved up to semiconductors.

Stephen

--
Stephen Trier KB8PWA "Is this what Andy Warhol meant by '15 minutes
Other: trier@ins.cwru.edu of fame?'" - lisbon@vpnet.chi.il.us
Home: sct@po.cwru.edu "As this is alt, that should probably be '15 Mb
of flame.'" - arthur@Smallworld.co.uk

63. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 16:01:08 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan16.160108.21217@ke4zv.atl.ga.us>
Source record: 28315
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <mofoCJnF6v.EyK@netcom.com> mofo@netcom.com (mofo) writes:
>in article <1994Jan14.160430.16810@lmpsbbs.comm.mot.com> eck001@email.mot.com (Chris Kerlin) scribbles in crayon:
>>At least as of a couple years ago...
>>Several shuttle onboard computers made by IBM use magnetic core memory
>>("beads and string") which limits the range of windspeeds that can be
>>accomodated at liftoff.
>>
>>But is anyone suprised that 1960s technology is used on the shuttle;
>>I'd hate to guess at how much of the design is on Hollerith cards.
>>
>
>i can vouch for that. i've seen the core sheets. i still have a vial of
>the raw core; looks like iron filings, theyre so small. ibm has a peculiar
>habit of taking an antiquated technology to the limit.

Which in this case was exactly what NASA wanted. SEUs are a problem with any solid state memory device. Core doesn't suffer from SEUs. It also has the charm of being non-volatile so the computers can be powered down when not in use for power saving, yet still be loaded and ready to execute when powered back up. Core is a perfectly good technology if you don't need vast amounts of RAM, and Shuttle doesn't. Core didn't set a speed limit on Shuttle computers, the slow bit slice parts, and the need to *vote* on every command did that. Man rated flight systems can't be allowed to lock up, core dump, or issue fraudulent commands to the flight hardware. At the time Shuttle was designed, there was nothing more reliable than core available. There still isn't, but ECC washed memory can suffice if care is taken. Ordinary microprocessors can't be trusted either since their registers and on board caches are subject to SEUs.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

64. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 16:45:37 UTC
From: root@jackatak.raider.net
Message-ID: <qe99Fc2w165w@jackatak.raider.net>
Source record: 28321
Cross-posted to: sci.electronics,rec.radio.amateur.space

mofo@netcom.com (mofo) writes:
> in article <1994Jan14.160430.16810@lmpsbbs.comm.mot.com> eck001@email.mot.com
> >At least as of a couple years ago...
> >Several shuttle onboard computers made by IBM use magnetic core memory
> >("beads and string") which limits the range of windspeeds that can be
> >accomodated at liftoff.
> >
> >But is anyone suprised that 1960s technology is used on the shuttle;
>
> i can vouch for that. i've seen the core sheets. i still have a vial of
> the raw core; looks like iron filings, theyre so small. ibm has a peculiar
> habit of taking an antiquated technology to the limit.
Oh boy! As a dedicated IBM-basher, this is painful, but let me remind
all you technocrats that the environments spacecraft operate in are
quite hostile indeed to solid-state CMOS devices. This is not IBM's
doing,they have simply taken a proven technology, albeit old and
perhaps outdated for terristrial use, and applied it to the VERY
hostile environment of space.

The core memeroy has several advantages over solid-state, not the
least of which is that if power is lost, for whatever reason, the
memory holds whatever settings it had...for longer than a UPS will
hold CMOS... Hollow-state is not suseptible to Ultra-violet erasure,
nor to EMP erasure...sure it takes very different designs, and has
limits that silicon technology does not, but it works in a very
hostile environment, and that is why it is used, NOT because IBM says
it should -- the equipment was SPEC'ed that way!

Ooooh.... that hurt me to type! ;^)

> they got out of their tso/mvs 60's era operating system. thats the one where
> you have to manually allocate disk tracks before saving a file. millions of
> corporate customers around the world think this is the state of the art in
> modern computer equipment, mostly because ibm says so.
And here I can breath again, because what has been typed is so: MVS
was a pig, and the choices exercised by it to allocate resources were
following an easier path... however, as any gray-flannel three-piece
suiter will tell ya: "No consultant ever got fired for recommending
IBM..." (Unless it was to Honeywell (BULL), Sperry, Burroughs, or
DEC ;^)
73,
Jack, W4PPT/Mobile (75M SSB 2-letter WAS #1657 -- all from the mobile! ;^)

```
+--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--+
| Jack GF Hill |Voice: (615) 459-2636 - Ham Call: W4PPT |
| P. O. Box 1685 |Modem: (615) 377-5980 - Bicycling and SCUBA Diving |
| Brentwood, TN 37024|Fax: (615) 459-0038 - Life Member - ARRL |
| root@jackatak.raider.net - "Plus ca change, plus c'est la meme chose" |
+--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--*--+
```

65. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 18:07:23 UTC
From: dgj2y@kelvin.seas.Virginia.EDU
Message-ID: <CJqICB.6Io@murdoch.acc.Virginia.EDU>
Source record: 28319
Cross-posted to: sci.electronics,rec.radio.amateur.space

OK, so how susceptible to SEUs are normal computer hardware? I know I have seen pictures of the astronauts using regular laptop computers on the shuttle to their normal work. They obviously are not controlling the flight hardware with them, but if I took a notebook computer with me on the shuttle, how often should I expect it to crash or output bad data?

dave jacobowitz
dgj2y@virginia.edu

66. ANS-015 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 18:13:10 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-014.01.1994@ampr.org>
Source record: 28323
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-014.01
AMSAT-NA OPPOSES INSTANT LICENSING

HR AMSAT NEWS SERVICE BULLETIN 014.01 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 15, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-014.01

AMSAT-NA OPPOSES FCC "INSTANT LICENSING" PROPOSAL

AMSAT-NA has filed comments with the FCC in opposition to the "instant licensing" proposal contained in a Notice of Proposed Rule Making, PR Docket 93-267. Under the FCC's proposal, unlicensed persons who pass an amateur license examination for the first time would immediately be permitted to operate for up to 120 days, using self-assigned call signs, while waiting for their licenses to arrive.

In its comments, AMSAT-NA cited the potential for abuse by persons who may never have had any intention of taking an examination, as well as the impossibility of verifying the self-assigned calls since they would not be registered in any database. The "guaranteed anonymity" of a self-assigned call sign system would, in AMSAT-NA's words, multiply the potential for interference by unlicensed persons with amateur radio operation. This is particularly relevant to the Amateur-satellite service, AMSAT-NA went on to say, because the 2M, 10M and 70CM bands, which presently contain the most popular satellite uplinks and downlinks, are also among the most likely to be affected by such interference. The international nature of satellite operation means that problems could be caused for amateurs, and govern-mental authorities, in other countries as well as in the United States.

As an alternative to "instant licensing," AMSAT-NA urged the FCC to pursue the use of electronic filing and processing of amateur license applic-ations. AMSAT-NA's comments in PR Docket 93-267 generally paralleled those of ARRL, with special emphasis on the problems which would be caused for the Amateur-satellite service.

/EX
SB SAT @ AMSAT $ANS-014.02
CORRECTED STS-60 KEPS

HR AMSAT NEWS SERVICE BULLETIN 014.02 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 15, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-014.02

WA5DID Provides Corrected STS-60 SAREX Keplerian Elements

In last week's ANS-008 SAREX bulletin, the STS-60 keplerian elements contained an incorrect epoch date. Please use the following keplerian set provided by Lou McFadin (WA5DID) and Gil Carman (WA5NOM).

STS-60
1 00060U 94034.56756353 .00033600 00000-0 25200-3 0 47
2 00060 57.0033 215.8607 0010675 264.1500 95.8328 15.72291901 26

Satellite: STS-60
Catalog number: 00060
Epoch time: 94034.56756353 (03-FEB-94 13:37:17.49 UTC)
Element set: 004
Inclination: 57.0033 deg
RA of node: 215.8607 deg Space Shuttle Flight STS-60
Eccentricity: .0010675 Prelaunch Element set JSC-004
Arg of perigee: 264.1500 deg Launch: 03-FEB-94 12:10 UTC
Mean anomaly: 95.8328 deg
Mean motion: 15.72291901 rev/day Gil Carman, WA5NOM
Decay rate: 3.3600e-04 rev/day*2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 254

The AMSAT News Service would like to thank WA5DID and WA5NOM for the updated and corrected keplerian elements for STS-60.

/EX
SB SAT @ AMSAT $ANS-014.03
TAPR HAS A NEW ADDRESS!

HR AMSAT NEWS SERVICE BULLETIN 014.03 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 15, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-014.03

Tucson Amateur Packet Radio (TAPR) Association Has Moved!

Tucson Amateur Packet Radio has moved its offices. The new mailing address is:

Tucson Amateur Packet Radio
8987-309 E. Tanque Verde Rd. #337
Tucson, AZ 85749-9399

The voice telephone number is (817) 383-0000. This number has a voice mail system attached and is available 24 hours a day. A FAX server will be operational within the next few weeks to automatically fax information to you.

The incoming FAX number is (817) 566-2544.

More information on the office move will be published in the Winter, 1994 edition of Packet Status Register.

[The AMSAT News Service (ANS) would like to thank Bob Nielsen (W6SWE) for this bulletin item. W6SWE can be reached at the following address: Internet: w6swe@tapr.org, or, w6swe@wb7tls.az.usa.na]

/EX
SB SAT @ AMSAT $ANS-014.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 014.04 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 15, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-014.04

Weekly OSCAR Status Reports: 14-JAN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1993 Dec 27-Jan 31
Mode-B : MA 0 to MA 180 | OFF
Mode-B : MA 180 to MA 220 |
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 240/-5
Mode-B : MA 250 to MA 256 | OFF
Omnis : MA 250 to MA 150 | Move to attitude 180/0, 31-Jan-94

L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jan 31-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
Poor Sun angle and battery testing need maximum OFF time.
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current FO-20 operating schedule:
From January '94 thru March '94, the analog mode and the
digital mode will be on alternately for a week at a time.
ANALOG MODE:
26-JAN-94 8:20 -TO- 02-FEB-94 6:50 UTC
09-FEB-94 7:15 -TO- 16-FEB-94 7:40 UTC
23-FEB-94 8:05 -TO- 02-MAR-94 6:40 UTC
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Up and running. Busy as usual. [WH6I]

PoSAT: Appears to still be on it's commercial frequency. There was a
message regarding amateur service that indicated it will be on
amateur frequencies at the end of the month. [WH6I]

ITAMSAT: On 1200 Baud, currently collecting WOD data. A note on the bird indicates that the BBS will return to operation soon. [WH6I]

MIR: Cosmonauts Vasili Tsibliev and Alexander Serebrov returned Friday, 14-JAN-94, to Earth after six months in space on-board MIR Russian space station. The TM-17 Soyuz spacecraft landed at 08:18 UTC in Karaganda. The two cosmonauts have been in space from 01-JUL-93. The Personal Messaging System (PMS) on-board MIR continues working under the callsign R0MIR-1, operated by the actual crew that arrived last Saturday in TM-18 Soyuz. [LW2DTZ]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

67. Re: Traksat 3.00!

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 19:32:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.207.1818.0NC5C0A7@compart.fi>
Source record: 28317

The registered version of Traksat is available from

Paul E. Traufler
111 Emerald Drive
Harvest, AL 35749
U.S.A

phone: (202) 726-5511

Leo Wikholm
e-mail: leo.wikholm@compart.fi

68. Weather satellite APT report 1/1994

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 19:34:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.208.1818.0NC5C0A8@compart.fi>
Source record: 28318

```
------------------------------------------------------------
Weather satellite APT report 1/1994
January 16, 1994
Station: Helsinki, Finland +60.23N +25.14E
------------------------------------------------------------

Satellite Frequency Status

NOAA 9 137,620 MHz normal
NOAA 10 137,500 MHz normal
NOAA 11 137,620 MHz normal
NOAA 12 137,500 MHz normal
Meteor 2-21 137,300 MHz not active in nothern latitudes
Meteor 3-5 137,300 MHz not active in northern latitudes

------------------------------------------------------------

Edited by Leo Wikholm, e-mail: leo.wikholm@compart.fi
```

69. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 19:43:25 UTC
From: devlin@lf.hp.com
Message-ID: <2hc5ct$kp1@hpavla.lf.hp.com>
Source record: 28316
Cross-posted to: sci.electronics,rec.radio.amateur.space

Dana Myers (myers@sunspot.West.Sun.COM) wrote:

: I'm sure none of us armchair designers would bother to consider that
: core memory is considerably more immue to radiation induced errors
: than semiconductor memory while we're re-designing the shuttle system,
: which operate in a region of considerably higher ambient radiation
: levels than on Earth...

I spend a lot of time testing for radiated immunity (and radiated emissions) problems on microprocessor-based instruments. Semiconductor memories generally do not have immunity problems with radiated fields. Besides, there's hardly an EM immunity problem that a Faraday cage can't solve if you can constrain your system to operate in one. Memory and CPU certainly fit in that category. Actually, most often they ARE caged to constrain the EM energy their clocks produce. This radiated energy doesn't bother them, but rather interferes with radio recievers and small signal transducers.

The statement about ambient radiation being higher in space than on earth is confusing. To what radiation are you referring? Cosmic? Transmitters (intentional and otherwise) are responsible for nearly all the EM fields in the frequency range that can induce unwanted currents in circuits and the farther you are from the source, the smaller they are.

--
Lee Devlin | HP Little Falls Site | phone: (302) 633-8697
| 2850 Centerville Rd. | email:
| Wilmington, DE 19808 | devlin@lf.hp.com

70. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-16 22:03:00 UTC
From: jeff@Name
Message-ID: <2hcdik$fm2@hpscit.sc.hp.com>
Source record: 28320
Cross-posted to: sci.electronics,rec.radio.amateur.space

Lee Devlin (devlin@lf.hp.com) wrote:
> Dana Myers (myers@sunspot.West.Sun.COM) wrote:

> : I'm sure none of us armchair designers would bother to consider that
> : core memory is considerably more immue to radiation induced errors
> : than semiconductor memory while we're re-designing the shuttle system,
> : which operate in a region of considerably higher ambient radiation
> : levels than on Earth...
>
> (stuff about electromagnetic radiation deleted)
>
> The statement about ambient radiation being higher in space than on
> earth is confusing. To what radiation are you referring? Cosmic?
> Transmitters (intentional and otherwise) are responsible for nearly all
> the EM fields in the frequency range that can induce unwanted currents
> in circuits and the farther you are from the source, the smaller they are.

We're talking about *ionizing* radiation. (Ionizing) radiation
resistance is an important design spec even in low earth orbit (LEO).
The shuttle passes through or near the South Atlantic Anomaly on most
flights.

Jeff
--
==
Jeff Gruszynski Any Standard Disclaimers Apply
Semiconductor Test Equipment
Systems Engineer
Hewlett-Packard
==
(415) or T 694-3381
Jeff_Gruszynski@hpatc3.desk.hp.com
==

71. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 05:10:10 UTC
From: devlin@lf.hp.com
Message-ID: <2hd6ji$q5e@hpavla.lf.hp.com>
Source record: 28322
Cross-posted to: sci.electronics,rec.radio.amateur.space

I (devlin@lf.hp.com) wrote:

: Richard Feynman discussed this in his excellent book _What_Do_You_Care
: What_Other_People_Think_.

: For those of you who don't know Feynman, he was the Nobel Prize-winning
: scientist that was part of the commission that investigated the
: Challenger accident. I was amazed to read that something as
: sophisticated as the shuttle would use something as antiquated as core
: memory. However, the shuttle's control software represents a large
: development investment and parts of it are borrowed from previous
: generation space programs. It also been thoroughly tested and therefore
: prohibitively expensive to change. That's why they're stuck with ancient
: hardware with which to run it.

I realize it is anathema to provide sources in a forumn that thrives on
speculation, conjecture, and hearsay but I'm going to go even further
since this will otherwise turn into a 'string that will not die'

Please forgive me for I'm about to do the unthinkable. I'm actually
going to quote from the book I referenced above. Remember, this man was
a Nobel prize-winning physisist who had inside access to the shuttle
development personnel during the investigation of the Challenger.

From page 192 of _What_Do_You_Care_What_Other_People_Think_:

"Although there's a lot of good software being written at Johnson, the
computers on the shuttle are so obsolete that the manufacturers don't
make them anymore. The memories in them are the old kind, made with
little ferrite cores that have wires going through them. In the
meantime we've developed much better hardware: the memory chips of
today are much, much smaller; they have much greater capacity; and
they're much more reliable. They have internal error-correcting codes
that automatically keep the memory good. With today's computers we
can design separate program modules so that changing the payload
doesn't require so much program rewriting.

Because of the huge investment in the flight simulators and all the
other hardware, to start all over again and replace the millions of
lines of code that they've already built would be very costly."

(There's a lot of associated information that discusses how each mission
is flown on simulators using the same software before the actual mission.)

So all of you core memory apologists can give it rest now. I think it's
pretty clear from the above excerpt that the core memory is a vestige of

the shuttle's past. It is not required for its alleged reliability or immunity to extraterrestrial electromagnetic events.

There's a lot of great information about the shuttle program in the book. I believe someone mentioned in an earlier posting that the shuttle doesn't need much memory and that's why core is acceptable. Here's why that's not correct:

From page 190:

"The shuttle's computers don't have enough memory to hold all the programs for the whole flight. After the shuttle gets into orbit, the astronauts take out some tapes and load in the program for the next phase of the flight -- there are a many as six in all. Near the end of the flight, the astronauts load in the program for coming down.

The shuttle has four computers on board, all running the same programs. All four are normally in agreement. If one computer is out of agreement, the flight can still continue. If only two computers agree, the flight has to be curtailed and the shuttle brought back immediately."

If memory requirements really were minimal, it wouldn't be necessary to be carrying all those tapes along.

While I'm at it, I should also mention that the shuttle astronauts have taken the HP41C calculator with them and gave it good reports for its reliablity. And no, it doesn't use core memory :-).

--
Lee Devlin | HP Little Falls Site | phone: (302) 633-8697
| 2850 Centerville Rd. | email:
| Wilmington, DE 19808 | devlin@lf.hp.com

72. APT-Satellites: Report JAN 15, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 08:45:10 UTC
From: peter.henne@gmd.de
Message-ID: <1994Jan17.084510.19537@gmd.de>
Source record: 28324
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, JAN 15, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)
Meteor 3-5: APT 137.30 On

Meteor 3-5 drifts into morning darkness. RF was off over
38 degrees NLat. As there is no IR-transmission, the satellite
will now be of only minor value for the northern hemisphere.
Meteor 2-21 is weak as always.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-5205 St.AUGUSTIN 1 |
|Fed.Rep. of Germany |
+----------------------------------------+
```

73. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 14:09:24 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan17.140924.24817@ke4zv.atl.ga.us>
Source record: 28325
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hc5ct$kp1@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>Dana Myers (myers@sunspot.West.Sun.COM) wrote:
>
>: I'm sure none of us armchair designers would bother to consider that
>: core memory is considerably more immue to radiation induced errors
>: than semiconductor memory while we're re-designing the shuttle system,
>: which operate in a region of considerably higher ambient radiation
>: levels than on Earth...
>
>I spend a lot of time testing for radiated immunity (and radiated
>emissions) problems on microprocessor-based instruments. Semiconductor
>memories generally do not have immunity problems with radiated fields.
>Besides, there's hardly an EM immunity problem that a Faraday cage can't
>solve if you can constrain your system to operate in one. Memory and
>CPU certainly fit in that category. Actually, most often they ARE caged
>to constrain the EM energy their clocks produce. This radiated energy
>doesn't bother them, but rather interferes with radio recievers and
>small signal transducers.
>
>The statement about ambient radiation being higher in space than on
>earth is confusing. To what radiation are you referring? Cosmic?
>Transmitters (intentional and otherwise) are responsible for nearly all
>the EM fields in the frequency range that can induce unwanted currents
>in circuits and the farther you are from the source, the smaller they are.

We're not talking about RF. We're refering to *ionizing* radiation. This
causes ionized paths in the substrate of ICs that can cause flipped bits.
These effects are generally temporary, hence *single* event upsets, but
cummulative damage can be permanent, and the stray heavy nuclei can cause
permanent stuck bits.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

74. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 14:15:07 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan17.141507.24926@ke4zv.atl.ga.us>
Source record: 28326
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <CJqICB.6Io@murdoch.acc.Virginia.EDU> dgj2y@kelvin.seas.Virginia.EDU (Dave Jacobowitz) writes:
>OK, so how susceptible to SEUs are normal computer hardware? I know I
>have seen pictures of the astronauts using regular laptop computers on
>the shuttle to their normal work. They obviously are not controlling
>the flight hardware with them, but if I took a notebook computer with
>me on the shuttle, how often should I expect it to crash or output bad
>data?

The Shuttle stays in a low enough orbit to receive considerable protection from radiation via the Earth's magnetic field, but it does pass through the SAA on most missions, and the radiation flux is higher there. Satellites that pass through the Van Allen belts get a real dose, and high intensity cosmic rays are a continous problem. If you look at the telemetry from the amateur satellites, you can get a good idea of the frequency of SEUs. Without ECC memory, the average laptop would likely suffer a flipped bit one or more times a day. If that bit is in an active area of program memory, you may have a crash. If it hits the stack, you'll almost certainly have a crash.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

75. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 14:53:11 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan17.145311.25166@ke4zv.atl.ga.us>
Source record: 28329
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>I (devlin@lf.hp.com) wrote:
>
>Please forgive me for I'm about to do the unthinkable. I'm actually
>going to quote from the book I referenced above. Remember, this man was
>a Nobel prize-winning physisist who had inside access to the shuttle
>development personnel during the investigation of the Challenger.

Feynman was a visionary physicist, a great teacher, and a wonderful
populariser of science, but he was not a computer systems reliability
engineer. He's commenting outside his field here.

>From page 192 of _What_Do_You_Care_What_Other_People_Think_:
>
> "Although there's a lot of good software being written at Johnson, the
> computers on the shuttle are so obsolete that the manufacturers don't
> make them anymore. The memories in them are the old kind, made with
> little ferrite cores that have wires going through them. In the
> meantime we've developed much better hardware: the memory chips of
> today are much, much smaller; they have much greater capacity; and
> they're much more reliable. They have internal error-correcting codes
> that automatically keep the memory good. With today's computers we
> can design separate program modules so that changing the payload
> doesn't require so much program rewriting.
>
> Because of the huge investment in the flight simulators and all the
> other hardware, to start all over again and replace the millions of
> lines of code that they've already built would be very costly."
>
>(There's a lot of associated information that discusses how each mission
>is flown on simulators using the same software before the actual mission.)
>
>So all of you core memory apologists can give it rest now. I think it's
>pretty clear from the above excerpt that the core memory is a vestige of
>the shuttle's past. It is not required for its alleged reliability or
>immunity to extraterrestrial electromagnetic events.

It's unsurprising that Shuttle computers aren't made anymore. They were
special built for the Shuttle, and we aren't building any more Shuttles.
However, the Shuttle computers have recently been upgraded, and three
of the four now do use some ECC memory for non-critical data storage.
ECC is *not* proof against SEUs, but it's much better than unprotected
memory. ECC can protect against single bit errors, and most double bit
errors, but a triple hit and it's game over. Core doesn't care.

>There's a lot of great information about the shuttle program in the
>book. I believe someone mentioned in an earlier posting that the
>shuttle doesn't need much memory and that's why core is acceptable.
>Here's why that's not correct:
>
>From page 190:
>
> "The shuttle's computers don't have enough memory to hold all the
> programs for the whole flight. After the shuttle gets into orbit, the
> astronauts take out some tapes and load in the program for the next
> phase of the flight -- there are a many as six in all. Near the end
> of the flight, the astronauts load in the program for coming down.
>
> The shuttle has four computers on board, all running the same
> programs. All four are normally in agreement. If one computer is out
> of agreement, the flight can still continue. If only two computers
> agree, the flight has to be curtailed and the shuttle brought back
> immediately."
>
>If memory requirements really were minimal, it wouldn't be necessary to
>be carrying all those tapes along.

There's no good reason to have the entire software load for the entire flight profile in the computer at once. Loading in the proper programs at the proper time from tape is perfectly acceptable. Does your computer keep every bit of software you use in memory at all times? Of course not. That's why we have hard disks. However, hard disks aren't that sturdy when subjected to launch vibration and G forces, so Shuttle uses tape instead for program storage.

Note, Apollo used the HP-35 calculator as backup for it's computers, so the necessary data loads aren't that large. Shuttle carries the HP-41CV as an ultimate backup to it's computers. If all four main computers fail, the pilot can manually calculate trajectories with it's aid. Naturally it isn't as robust as the normal computers, but it's better than nothing, and takes up little mass or volume.

Note also that program bloat can be traced almost completely to having excess RAM available. Programs naturally expand to fill the space available, witness Wordstar. It was a great fast program on a 48 kb Z-80 system, but now it's a multi-megabyte dog on a Windows PC with 8+ megs of RAM. And that's 166 times more RAM to develop a bit error that can crash the system. To a large degree, reliability is a function of parts count. The fewer parts, the less to go wrong.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

76. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 15:50:39 UTC
From: esrne@csv.warwick.ac.uk
Message-ID: <2hec4f$eqd@crocus.csv.warwick.ac.uk>
Source record: 28327
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan17.140924.24817@ke4zv.atl.ga.us>,
gary@ke4zv.atl.ga.us (Gary Coffman) writes:
%In article <2hc5ct$kp1@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
%%Dana Myers (myers@sunspot.West.Sun.COM) wrote:
%%
%%: I'm sure none of us armchair designers would bother to consider that
%%: core memory is considerably more immue to radiation induced errors
%%: than semiconductor memory while we're re-designing the shuttle system,
%%: which operate in a region of considerably higher ambient radiation
%%: levels than on Earth...
%%
%%I spend a lot of time testing for radiated immunity (and radiated
%%emissions) problems on microprocessor-based instruments. Semiconductor
%%memories generally do not have immunity problems with radiated fields.

[stuff binned]

%We're not talking about RF. We're refering to *ionizing* radiation. This
%causes ionized paths in the substrate of ICs that can cause flipped bits.
%These effects are generally temporary, hence *single* event upsets, but
%cummulative damage can be permanent, and the stray heavy nuclei can cause
%permanent stuck bits.
%
%Gary
%

Thats why "silicon on saphire" technology is employed in space systems and rad-hard
applications.
Prevents latchup etc.

--
Phil

77. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 16:00:48 UTC
From: rdewan@casbah.acns.nwu.edu
Message-ID: <2hecng$307@news.acns.nwu.edu>
Source record: 28328
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan17.141507.24926@ke4zv.atl.ga.us>,
Gary Coffman <gary@ke4zv.atl.ga.us> wrote:

>Without ECC memory, the average laptop would likely suffer a flipped bit
>one or more times a day. If that bit is in an active area of program memory,
>you may have a crash. If it hits the stack, you'll almost certainly have
>a crash.

Most IBM PC clones have just a parity check. No ECC. Unless a chip is bad,
you almost never see a memory fault.

Use of ECC protected memory is much more common in minis and larger
machines.

Rajiv
aa9ch
r-dewan@nwu.edu

78. FO-20 mode JA Help

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 16:20:12 UTC
From: k9jma@cbnewsc.cb.att.com
Message-ID: <CJs81u.68p@cbnewsc.cb.att.com>
Source record: 28330

I've had a lot of fun on RS-10 and so have been working on getting set up for other satellites. Thought to try FO-20 mode JA next since it is a low orbit satellite like RS-10 and so the only additional equipment needed should be a 435 MHz receiver. Expected to be able to use simple omnidirectional antennas like for RS-10 but it doesn't seem to be turning out that way.

Can't copy the FO-20 downlink or beacon at all with just a "J" and R-7000 (with fair MRF901 2db NF preamp) - had to use the crossed Yagis intended for mode B uplink to AO-13 to get solid copy!

For 146 MHz uplink the 60 Watts into a "J" that gets me a 569 RS-10 mode A downlink doesn't produce any audible FO-20 mode JA downlink. Had to use crossed Yagis intended for mode B downlink for AO-13 to produce passable results.

Use of gain antennas for LEO satellite is a pain with my "armstrong" rotator system. (Power rotators and automated tracking wouldn't be necessary for AO-13 and I hope to avoid the effort if I can.)

So, it seems that it takes about 10db more "effort" than I had expected on both up and down links. Comments from other FO-20 users on whether my results are consistent with their experience would be greatly appreciated.

Thanks and 73 de Ed K9JMA
--
Ed Schaefer K9JMA ham radio N97178 aviation

79. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 17:02:55 UTC
From: gpetty@rain.atms.purdue.edu
Message-ID: <CJsA0w.HM9@mentor.cc.purdue.edu>
Source record: 28333
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan13.160647.10468@mnemosyne.cs.du.edu> rdavis@nyx10.cs.du.edu (Robert Davis) writes:
>
>I dunno where I read the information about vacuum tubes, but yes,
>I have read that NASA uses tubes for exactly the reasons you specify.
>Tubes are resistant to the various forms of radiation in space.
>And tubes do not need envelopes ... the vacuum of space is better
>than the vacuum in any vacuum tube ever used on Earth.
>====
>Still, I think that not enclosing the tubes in something is kind of
>dumb 'cause any gases vented by the spacecraft will continue to travel
>along with the spacecraft and degrade the vacuum around the tubes.
>

I don't think you have to worry about the vented gases traveling with the spacecraft for any appreciable length of time and thus spoiling the vacuum. Any unconfined gas in the vacuum of outer space will expand outward at an extremely high rate of speed. In fact, each individual gas molecule will travel more or less indefinitely (i.e., until it runs into something) in a straight line with whatever speed and direction it happened to have when it cleared the vent port.

--
Grant W. Petty gpetty@rain.atms.purdue.edu
Asst. Prof. of Atmospheric Science
Dept. of Earth & Atmospheric Sciences (317) 494-2544
Purdue University, West Lafayette IN 47907-1397 FAX:(317) 496-1210

80. newsgroup charter

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 17:15:56 UTC
From: xx347@cleveland.Freenet.Edu
Message-ID: <2heh4c$1k2@usenet.INS.CWRU.Edu>
Source record: 28331

Can someone post the charter for this newsgroup?

-- Brian

--
,~~~~~|~~~~~|~~~\ ,~~~~ Students for the Exploration and Development of Space
`---, |--- | |`---, CWRU Chapter - (xx347) - "go seds" or "go space"
`---' `---- `---'-----' Ad Astra Per Ardua (To the Stars by Effort)
contact Brian (754-2078, bjr) or Yan (371-4364, yxl20) for more information

81. shuttle computers ad naseum...

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 17:16:58 UTC
From: Chris Terwilliger <a229aa@email.sps.mot.com>
Message-ID: <1994Jan17.171658.13376@newsgate.sps.mot.com>
Source record: 28332

for those who don't know but want to know or think they know...
i know it goes against the internet rules to post factual information
but here goes...

> From aio!deltahp.jsc.nasa.gov!bmears Sat Jul 11 22:14:50 CDT 1992
> Article: 2948 of sci.space.shuttle
> Newsgroups: sci.space.shuttle
> Path: aio!deltahp.jsc.nasa.gov!bmears
> From: bmears@deltahp.jsc.nasa.gov (Brad Mears)
> Subject: shuttle computer FAQ
> Message-ID: <1992Jul10.153815.17618@aio.jsc.nasa.gov>
> Sender: bmears@gothamcity.jsc.nasa.gov (Brad Mears)
> Reply-To: bmears@deltahp.jsc.nasa.gov
> Organization: Barrios Technology @ NASA/JSC; Houston
> Date: Fri, 10 Jul 1992 15:38:15 GMT
>
> My offer to supply a FAQ for the shuttle computer system has met
with more
> interest than I expected. Instead of sending it via email, I've
decided to
> post it for everybody. Enjoy.
>
> --
> Brad Mears
> bmears@deltahp.jsc.nasa.gov No disclaimer, no
quote
>

>
> Frequently Asked Questions about the Space Shuttle computers
> --
>
> Every few weeks, someone on sci.space.shuttle asks about the
computers used
> on the shuttle. Since I used to be intimately involved with flight
software,
> I decided to create a FAQ list for this topic.
>
> This FAQ is a personal effort on my part. It is not blessed by NASA
or my
> employer. The data in here was collected during several years of
working in
> the flight software arena. If you believe any part of this document

is in
> error, contact me and I'll try to resolve the issue thru further
research.
>
> 1) What kind of computer does the shuttle use?
> All of the flight-critical software is executed on five IBM
AP-101 General
> Purpose Computers (GPCs). The crew may use commercially
available laptops
> and programmable calculators for non-critical applications.
>
> The AP-101 is a descendant of the IBM 360/370 family that was
specially
> redesigned for use on the shuttle. By today's standards, the
AP-101
> is incredibly slow. The original AP-101B version is being
replaced by
> an updated AP-101S. The new version is still nowhere close to
state
> of the art, but it is an improvement none the less.
>
> 2) Tell me more about the GPCs
> The AP-101 is a very different computer than what most people are
familiar
> with. Like most computers used in aerospace applications, it
does not
> have a keyboard or CRT. It is a black box with chips and a power
supply.
>
> Relax - there *are* keyboards and CRTs available for the crew,
but they
> aren't considered part of the GPC. In fact, there isn't even a
one-to-one
> correspondence between computers and keyboards. Any CRT or
keyboard can
> be addressed by any GPC, depending on the state of cockpit
switches.
> BTW, the keyboards aren't your typical QWERTY keyboard. They are
a funky
> hexadecimal keypad with several special-purpose function keys.
>
> Besides the CPU, the GPC has twenty-five (25) additional
processors.
> All of the processors besides the CPU are dedicated to I/O.
There is one
> processor for each of the twenty-four serial data busses the
AP-101 uses
> to control and monitor the vehicle.
>
> Each of the I/O processors can be programmed independently to

handle
> incoming/outgoing data transfers for its respective data bus. The
> twenty-fifth processor is a master I/O scheduler. It serves as an
> interface between the CPU and the other I/O processors.
>
> The use of truly independent I/O processors allows the CPU to
concentrate
> on number-crunching and not get bogged down with I/O. This is
very
> important considering the hard real-time requirements the
software must
> meet.
>
> 3) How much memory do the GPCs have?
> The amount of memory available in the AP-101B is 212,992 16-bit
words.
> The AP-101S holds up to 524,288 words. Yes, this is ludicrously
small
> by today's standards. These numbers do not include error
detection bits.
> The memory in the AP-101B is honest-to-gosh ferrite core. The
AP-101S
> uses normal RAM.
>
> 4) How big are the GPCs?
> The original AP-101B consists of two 64 pound boxes, each of
which
> are 36"x12"x12" (approximately). One of the two boxes is the CPU
and
> most of the memory. The other box houses the 25 independent IO
processor
> chips and the rest of the memory. The AP-101S is housed in one
similarly
> sized box.
>
> 5) OK, so now I know what a GPC *is*. What does it *do*?
> The shuttle is a fly-by-wire vehicle (like the F-16). This means
that
> there are no direct connections between the cockpit controls and
the
> vehicle. Every switch and every button is connected to the
computers.
> The engines, SRBs, flaps, payload bay doors, etc are all
controlled by
> the software.
>
> The entire flight, from pre-launch to roll-out, is under computer
control.
> This isn't to say that the crew is unnecessary. They are needed,
but

> the software is between them and everything they do.
>
> When the software detects a change of state in a switch, it
determines
> what that switch is used for, what the new state means, and if
the command
> is legal at this time. Once it has done all that, then the
software will
> issue the appropriate command via the serial data busses.
>
> An example - If the commander wants to push the nose down during
flight,
> he pushes the forward on the joystick in front of him. The GPC
reads this
> input, determines what it means, and then issues commands to the
proper
> control surfaces. These commands are electronic signals that go
to an
> actuator. The actuator is what actually moves the aero-surface.
Depending
> on the actuator, it may use hydraulics or an electric motor to
move the
> surface.
>
> It is very important to realize that the shuttle is completely
fly-by-wire.
> If the flight software fails to operate, the vehicle will crash.
Period.
>
> 6) Can the astronauts override the software?
> Yes and no. Yes the astronauts can override decisions made by
the software.
> But the mechanism used to perform the override is in SOFTWARE!
Do you see
> the catch? If the software is fouled up badly enough, the
override won't
> work.
>
> 7) Why five computers?
> Redundancy. Every aspect of the shuttle is designed with
redundant
> systems (when possible). The goal of the shuttle is to withstand
any
> two failures and still maintain crew safety. This goal is met
with
> very few exceptions. For the computer system, there are two
levels of
> redundancy. The first level of redundancy is thru the use of
multiple
> computers running the same software. The second level is thru

the use
> of two completely independent sets of software.
>
> The five General Purpose Computers (GPCs) are all running
simultaneously
> during flight. Four of them are running the Primary Avionics
Shuttle
> Software and one of them is running the Backup Flight Software.
During
> normal flight, the four PASS machines run the exact same
software, using
> the exact same inputs. Each of the four has equal responsibility
for
> controlling the vehicle. If any of them fail, the others will
override
> it and the vehicle is still safe.
>
> If the four PASS machines have failed for some reason (hardware
or
> software), the crew can engage the Backup Flight Software.
During normal
> flight, the BFS is running, but the settings of certain hardware
switches
> prevent it from taking control of the vehicle. After BFS engage,
this
> changes - the 4 PASS machines are prevented from issuing commands
to the
> vehicle and the BFS machine is now in full control.
>
> 8) How does the crew engage the Backup Flight Software?
> The Commander and Pilot each have a bright red switch located
prominently
> in front of them on their Rotational Hand Controller (joystick).
At any
> time during flight, either or both of them can depress this
switch. At
> that time, an irreversible process begins.
>
> Some special purpose boxes called Backup Flight Controllers
detect this
> event and turn certain discrete signals to the GPCs off or on.
These
> hardware signals are what actually allow any given GPC to issue
control
> commands to the vehicle.
>
> Within 40 milliseconds, all of the PASS computers will be
disabled from
> sending commands to the vehicle and the BFS computer will be in
control.

> Other than some changes on the CRTs, the transition to BFS is
mostly
> transparent.
>
> Unfortunately, there is a small (very small) chance that the
transition
> from PASS to BFS will not succeed. That is, the PASS machines
will be
> disabled AND the BFS machine will be disabled. If this happens,
the
> vehicle will be uncontrolled and uncontrollable. The odds of
recovering
> from this scenario are vanishingly small. For this reason, the
crew will
> avoid engaging BFS as long as possible.
>
> 9) Who wrote the software and what language is it in?
> The PASS was written by IBM Federal Systems Division. Most of it
is
> written in an obscure language called HAL/S and some of it in
assembly.
> HAL/S is something like a cross between Pascal and FORTRAN. It
has
> built in support for vector and matrix arithmetic. This is
useful since
> all guidance & navigation calculations make heavy use of these
structures.
>
> The BFS was written by Rockwell International and is mostly in
assembly.
>
> 10) What Operating System do the GPCs use?
> A proprietary one of course. :-) Seriously, the PASS and BFS
each have
> their very own custom designed OS. It ain't like nothin' else in
the world.
>
> 11) How is the software tested?
> Testing flight software is a multi-stage process. NASA has
several
> simulators (of varying fidelities) that are built around one or
more of
> the flight computers. This allows the tester to run the actual
flight
> software in real-time on a real computer.
>
> After a programmer changes a module, he tests that module on the
first
> level (lowest fidelity) simulator. If it behaves as expected, it
is given

> to the people who do integration testing.
>
> Eventually, an entire release of the flight software is delivered
to
> the Shuttle Avionics Integration Laboratory (SAIL). SAIL is the
best
> avionics simulator in the world. It uses real flight-ready
hardware
> tied into environment simulators. That is, it has 5 real GPCs, 3
CRTs,
> real multiplexers, etc. A full-up simulation in SAIL has an
astronaut
> in the simulator cockpit and about 30 engineers at various test
stations
> supporting the effort. The SAIL is capable of simulating all
phases of
> Shuttle flight. It is the final arbiter of whether or not the
software
> is ready to fly.
>
>
> 12) Why doesn't NASA use more modern computers?!?!?!?!
> This issue really bugs a lot of people. A $2000 486 PC is quite
a bit
> faster than the AP-101 and can hold a whole lot more memory. So
why
> doesn't NASA yank out the AP-101 and stuff in a PC?
>
> There are several reasons - reliability, certification, and
performance.
>
> Reliability - The AP-101 has been built to withstand extremes in
> temperature, vibration, radiation, etc. PCs aren't.
>
> Certification - Before ANY piece of hardware is allowed on the
shuttle,
> it has to undergo extensive testing. Does the case release toxic
fumes
> if it catches on fire? Does it operate the same in zero-G as it
does on
> Earth? How about at 3-G? Are there sharp edges that can cut
anything?
> Is it compatible with the orbiter's power system? There are
thousands
> of questions like this. For a complex piece of flight-critical
hardware,
> the certification process can take millions of dollars. For
example,
> the upgrade from the AP-101B to the AP-101S took several years
and untold

> millions of dollars. And this was for an UPGRADE! Can you
imagine how
> much longer it would take for a completely new design?
>
> Performance - It is not clear to me that even a fast 486 could
meet the
> real-time requirements for the shuttle flight software. The GPCs
have
> to process a LOT of input data. If it fails to provide an output
on time,
> very bad things could happen. The use of multiple processors in
the GPCs
> is something a PC just can't compare with.
>
> Besides the issues of reliability, certification, and
performance, there
> one more very good reason to stick with the current computers.
They work!
> Yes, they're old and slow and new computers are "better". So
what? The
> current setup does the job in an acceptable manner. If NASA had
infinite
> money, then replacing the GPCs could be justified. But right
now, there
> are other things the money could be used for.

Brad worked flight software issues before becoming a professional UNIX
Wizard. He works on-site at JSC in building 12, up on the second
floor, but I don't know what he's up to these days. I oughta go ask --
it's bound to be something interesting.

-- Ken Jenks, NASA/JSC/GM2, Space Shuttle Program Office
kjenks@gothamcity.jsc.nasa.gov (713) 483-4368

"NASA turns dreams into realities and makes science fiction
into fact" -- Daniel S. Goldin, NASA Administrator

* Chris Terwilliger, AA7WD a229aa@email.sps.mot.com *
* Motorola AA7WD@N7MRP.AZ.USA.NA *
* Phoenix Corporate Research Labs those who forget the past *
* 2100 E. Elliot Rd. EL508 are condemned to repeat it *
* Tempe, AZ 85284 - George Santayana *

82. ARLK001 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 17:58:51 UTC
From: lhurder@arrl.org
Message-ID: <$arlk001.1994@ampr.org>
Source record: 28353
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK001
ARLK001 Keplerian data

ZCZC SK68
QST de W1AW
Keplerian Bulletin 1 ARLK001
From ARRL Headquarters
Newington, CT January 8, 1994
To all radio amateurs

SB KEP ARL ARLK001
ARLK001 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94005.12150341 -.00000075 10000-3 0 2399
2 14129 27.2067 348.0660 6021024 143.8064 278.2612 2.05878444 51456
RS-10/11
1 18129U 87054 A 93364.64889244 0.00000016 13499-5 0 8519
2 18129 82.9288 93.4276 0012860 127.5376 232.6947 13.72328401326790
UO-11
1 14781U 84021 B 94006.06752827 0.00000426 80258-4 0 6559
2 14781 97.7949 28.3246 0013056 68.2254 292.0340 14.69116428526505
RS-12/13
1 21089U 91007 A 94003.81201797 0.00000013 -16601-5 0 6448
2 21089 82.9224 133.3515 0028470 204.2513 155.7306 13.74032105146079
AO-13
1 19216U 88051 B 94004.70116240 -.00000337 10000-4 0 8536
2 19216 57.8718 275.2489 7205805 332.1178 3.3712 2.09722778 11086
UO-14
1 20437U 90005 B 94006.22554547 0.00000082 48814-4 0 9542
2 20437 98.6023 93.1440 0010518 311.4016 48.6262 14.29814904206444
AO-16
1 20439U 90005 D 94006.21737978 0.00000054 38073-4 0 7558
2 20439 98.6104 94.2056 0011016 312.1386 47.8862 14.29870760206453
DO-17
1 20440U 90005 E 94006.18743421 0.00000080 48113-4 0 7540
2 20440 98.6110 94.4467 0011059 311.0634 48.9592 14.30008924206461
```

```
WO-18
1 20441U 90005 F 94006.22993552 0.00000057 39165-4 0 7550
2 20441 98.6104 94.4998 0011727 311.7436 48.2753 14.29985551206474
LO-19
1 20442U 90005 G 94006.21884516 0.00000081 48397-4 0 7542
2 20442 98.6114 94.7089 0011952 311.1404 48.8749 14.30079012206489
FO-20
1 20480U 90013 C 94001.44262432 -.00000033 58892-6 0 6506
2 20480 99.0152 184.9151 0541111 357.3917 2.4392 12.83223005182747
AO-21
1 21087U 91006 A 94006.21488178 0.00000094 82657-4 0 4137
2 21087 82.9427 262.5683 0034953 173.2916 186.8711 13.74530992147330
UO-22
1 21575U 91050 B 94006.16636321 0.00000132 59170-4 0 4550
2 21575 98.4530 83.8172 0008635 55.6215 304.5789 14.36879873129819
KO-23
1 22077U 92052 B 94002.16351446 -.00000037 10000-3 0 3405
2 22077 66.0861 267.5903 0007830 328.5974 31.4576 12.86282748 65437
Arsene
1 22654U 93031 B 93361.28113215 -.00000051 10000-3 0 2117
2 22654 1.4185 112.4561 2935300 163.8590 194.2493 1.42195961 3311
KO-25
1 22827U 93061 E 94002.11658193 0.00000049 37692-4 0 3053
2 22827 98.6675 79.4666 0009564 328.4467 31.6152 14.27803340 13992
IO-26
1 22826U 93061 D 94002.12352015 0.00000048 37498-4 0 2431
2 22826 98.6726 79.4914 0009286 340.8280 19.2572 14.27701091 13994
AO-27
1 22825U 93061 C 94002.41089026 0.00000028 29480-4 0 2420
2 22825 98.6729 79.7643 0008661 340.3461 19.7388 14.27598458 14037
PO-28
1 22829U 93061 G 94001.75322183 0.00000049 37763-4 0 2352
2 22829 98.6670 79.1269 0010186 328.1394 31.9170 14.27993596 13944
Mir
1 16609U 86017 A 94006.24838594 0.00011734 15070-3 0 831
2 16609 51.6190 279.2758 0005534 168.7781 191.3337 15.59583166450781

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
January 11, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

83. ARLK002

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 18:02:43 UTC
From: lhurder@arrl.org
Message-ID: <$arlk002.1994@ampr.org>
Source record: 28354
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK002
ARLK002 Keplerian data

ZCZC SK69
QST de W1AW
Keplerian Bulletin 2 ARLK002
From ARRL Headquarters
Newington, CT January 15, 1994
To all radio amateurs

SB KEP ARL ARLK002
ARLK002 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94012.88782746 -.00000337 10000-3 0 2526
2 14129 27.1999 346.8463 6020165 145.8302 274.3239 2.05879874 51616
RS-10/11
1 18129U 87054 A 94012.18938195 0.00000043 30277-4 0 8533
2 18129 82.9265 84.1595 0012815 92.4751 267.7871 13.72329421328513
UO-11
1 14781U 84021 B 94010.08597013 0.00000380 72457-4 0 6562
2 14781 97.7948 32.1580 0013012 56.2907 303.9538 14.69119704527098
RS-12/13
1 21089U 91007 A 94003.81201797 0.00000013 -16601-5 0 6448
2 21089 82.9224 133.3515 0028470 204.2513 155.7306 13.74032105146079
AO-13
1 19216U 88051 B 94013.76090682 -.00000586 10000-4 0 8652
2 19216 57.8727 273.6690 7205576 332.7751 3.3757 2.09726934 11278
UO-14
1 20437U 90005 B 94010.77417742 0.00000091 52567-4 0 9553
2 20437 98.6020 97.6365 0010436 297.1869 62.8248 14.29816216207093
AO-16
1 20439U 90005 D 94010.27599894 0.00000090 52081-4 0 7568
2 20439 98.6100 98.2182 0010807 299.7021 60.3085 14.29872172207037
DO-17
1 20440U 90005 E 94010.24566329 0.00000085 49855-4 0 7552
2 20440 98.6104 98.4590 0010937 298.8420 61.1664 14.30010001207045
```

```
WO-18
1 20441U 90005 F 94010.77802339 0.00000076 46420-4 0 7561
2 20441 98.6102 98.9976 0011564 297.9734 62.0277 14.29986901207120
LO-19
1 20442U 90005 G 94010.27687465 0.00000090 52015-4 0 7550
2 20442 98.6110 98.7224 0011738 298.7184 61.2818 14.30080180207066
FO-20
1 20480U 90013 C 94010.95413140 -.00000034 50320-7 0 6517
2 20480 99.0159 192.6118 0541004 335.8403 21.8259 12.83223133183969
AO-21
1 21087U 91006 A 94012.62069919 0.00000094 82657-4 0 4159
2 21087 82.9431 257.8282 0035513 155.4415 204.8441 13.74531504148215
UO-22
1 21575U 91050 B 94010.20521252 0.00000086 43783-4 0 4568
2 21575 98.4527 87.7827 0008506 45.5057 314.6824 14.36880739130394
KO-23
1 22077U 92052 B 94010.71614680 -.00000037 10000-3 0 3519
2 22077 66.0891 249.6865 0008292 327.4530 32.5976 12.86283043 66534
Arsene
1 22654U 93031 B 93361.28113215 -.00000051 10000-3 0 2117
2 22654 1.4185 112.4561 2935300 163.8590 194.2493 1.42195961 3311
KO-25
1 22827U 93061 E 94010.31562943 0.00000105 60374-4 0 3169
2 22827 98.6654 87.5982 0008559 305.2642 54.7730 14.27806288 15164
IO-26
1 22826U 93061 D 94010.74365142 0.00000064 44049-4 0 2543
2 22826 98.6708 88.0424 0008909 315.3567 44.6895 14.27703185 15226
AO-27
1 22825U 93061 C 94010.75128956 0.00000091 54921-4 0 2532
2 22825 98.6699 88.0360 0008369 315.3218 44.7287 14.27601262 15225
PO-28
1 22829U 93061 G 94010.23145061 0.00000090 54208-4 0 2464
2 22829 98.6671 87.5394 0009751 303.3262 56.6985 14.27996332 15156
Mir
1 16609U 86017 A 94013.87317543 0.00007697 10058-3 0 940
2 16609 51.6177 240.9278 0005340 194.2938 165.7904 15.59721588451970

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
January 18, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

84. Re: shuttle computers ad naseum...

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 19:18:29 UTC
From: galen@picea.CFNR.ColoState.EDU
Message-ID: <CJsGAt.ECJ@yuma.ACNS.ColoState.EDU>
Source record: 28334

I love the way the FAQ fits on an 80-column machine--- NOT!

85. Sat. Frequencies

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 20:56:54 UTC
From: benjie@hip-hop.sbay.org
Message-ID: <2heu2m$7h5@hip-hop.sbay.org>
Source record: 28348

I started sat tracking just couple of weeks ago. I heard MIR and
OSCAR 21, but I still need a list of frequencies for other sat. If
anyone have any information, they are very welcome and appreciated.

Benjie

86. Re: FO-20 mode JA Help

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 22:00:28 UTC
From: greg@core.rose.hp.com
Message-ID: <CJsnst.J23@icon.rose.hp.com>
Source record: 28347

edwin.m.schaefer (k9jma@cbnewsc.cb.att.com) wrote:
: So, it seems that it takes about 10db more "effort" than I had expected on
: both up and down links. Comments from other FO-20 users on whether my
: results are consistent with their experience would be greatly appreciated.
:
Well, that explains the dismal results this past weekend. I thought that
FO-20 would be a good next step after getting comfortable with RS-10; maybe
not.

Whatsa good-but-minimal FO-20 setup look like? I'd rather not have to push
my luck with the neighbors by setting up 10' crossed yagi's on 2-axis motors.

Greg KD6KGW

87. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-17 23:49:40 UTC
From: moisan@bronze.lcs.mit.edu
Message-ID: <2hf86k$lr@bronze.lcs.mit.edu>
Source record: 28339
Cross-posted to: sci.electronics,rec.radio.amateur.space,sci.space.shuttle

In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:

>While I'm at it, I should also mention that the shuttle astronauts have
>taken the HP41C calculator with them and gave it good reports for its
>reliablity. And no, it doesn't use core memory :-).

Hmmm, will they take an HP48 with them? That thing could probably run
the Shuttle for them. <bg> And double as a Game Boy! :)

On a related topic, it was mentioned in sci.space.shuttle once, during
last year's interminable shuttle launch aborts, that the Space Shuttle
Main Engine controllers used 68000's. Those can't possibly use core.
And as the Shuttle apparently passes through the Anomaly on its way
up, the controllers would be subject to SEU's, no? Sensor failures on
the engines, I've heard of; controller crashes, I have not. Why?

...Dave

--
| David Moisan, N1KGH /^_/^\ moisan@silver.lcs.mit.edu |
| 86 Essex St. Apt #204 (o ^ o) n1kgh@amsat.org |
| Salem. MA 01970-5225 | | ce393@cleveland.freenet.edu |
| |

88. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 00:12:31 UTC
From: whit@u.washington.edu
Message-ID: <2hf9hf$2eg@news.u.washington.edu>
Source record: 28338
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan17.145311.25166@ke4zv.atl.ga.us>,
Gary Coffman <gary@ke4zv.atl.ga.us> wrote:
>In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>>I (devlin@lf.hp.com) wrote:
>>Please forgive me for I'm about to do the unthinkable. I'm actually
>>going to quote from the book I referenced above. Remember, this man was
>>a Nobel prize-winning physisist who had inside access to the shuttle
>>development personnel during the investigation of the Challenger.

>Feynman was a visionary physicist, a great teacher, and a wonderful
>populariser of science, but he was not a computer systems reliability
>*engineer*. He's commenting outside his field here.

Feynman's job description at Los Alamos (working on
the first A-bomb) was 'Head of computation section', and his
last employment (at the time of his death) was with Thinking
Machines, Inc. While he is best known for his physics work,
his fast logarithm algorithm is also pretty widely respected.

He was NOT outside his field here. And, he wouldn't
care whether he was or not (you judge the ideas on their
own merits, not on the merits of their spokesmen).

John Whitmore

89. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 00:29:18 UTC
From: mrb1@cbnewsh.cb.att.com
Message-ID: <CJsuow.J5I@cbnewsh.cb.att.com>
Source record: 28340
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan17.145311.25166@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>
>Note, Apollo used the HP-35 calculator as backup for it's computers,

Perhaps I am mistaken, but didn't the HP-35 calculator become available in 1972 ? Many of the Apollo flights (if not all) were over by then. Of course, there was still Skylab and ASTP, but I'm not sure that this is what you meant.

M. Baker
WA3ZXO
(who worked all summer between 11th and 12th grade to buy an HP-35 for $395)

90. Re: DO-17 SWL?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 00:52:03 UTC
From: tcline@hplvec.LVLD.HP.COM
Message-ID: <116260001@hplvec.LVLD.HP.COM>
Source record: 28341

In rec.radio.amateur.space, tavernin@sun1.interlan.com (Victor Tavernini) writes:

> Does anybody know the SWL address for Dove 17? I know I could send
> a message through the KO-23 gateway ... but since my license hasn't
> arrived ...
>
> Thanks,
>
> Victor Tavernini
> Racal-Datacom, Inc.
>
> tavernin@sun1.interlan.com

Try py2bjo@amsat.org . I received the following from DOVE starting at
about 16:57 UTC December 23, 1993:

> DOVE-1>BRAMST <UI (Text)>:
> 8th Dec 93.
>
> Please send reception reports and address
> details to Junior py2bjo@amsat.org or
> py2bjo@py2gn KO-23 gateway in order to
> receive a DOVE QSL card.
>
> 73 VK7ZBX (Dove Command team)

73

Ted Cline, N0RQV
ted_cline@hpisla.lvld.hp.com
Day: (303) 679-2352

91. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 02:32:39 UTC
From: jimc@tau-ceti.isc-br.com
Message-ID: <4456@tau-ceti.isc-br.com>
Source record: 28336
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>While I'm at it, I should also mention that the shuttle astronauts have
>taken the HP41C calculator with them and gave it good reports for its
>reliablity.

Hmm, "Seems to work OK every time we try it" versus "Guaranteed to work perfectly by the manufacturer under the conditions specified" are quite different. No way I'd want to take a ride with computers put together by the sort-parts-for-faster-than-specified-operation crowd, whose machines' testing is about as thorough as the HP's in this report.

Maybe the HP _is_ good enough to run the shuttle, but for something that critical I'd want some proof, both theoretical and experimental.

To continue to partially quote Feynman, while he thought the Shuttle's computer systems seemed crufty, he also admitted that they were the only major (read: extremely complex) subsystem of the Shuttle that _didn't_ have performance problems, and that worked exactly as designed. Maybe these rickety old computers are doing something right? (They may be a royal pain in the ass, but so long as they do the job right they've got a lot going for them.)

--
+----------------+
! II CCCCCC ! Jim Cathey
! II SSSSCC ! ISC-Bunker Ramo
! II CC ! TAF-C8; Spokane, WA 99220
! IISSSS CC ! UUCP: uunet!isc-br!jimc (jimc@isc-br.isc-br.com)
! II CCCCCC ! (509) 927-5757
+----------------+
One Design to rule them all; one Design to find them.
One Design to bring them all and in the darkness bind
them. In the land of Mediocrity where the PC's lie.

92. KO-23 Gateway ?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 04:39:46 UTC
From: kd6oat@kd6oat.ampr.ORG
Message-ID: <2150@kd6oat.ampr.org>
Source record: 28337

kd6oat@kd6oat.ampr.org
X-PCElm-Version: 3.2
X-Mailer: PCElm 3.21

I'd like to send a message to py2bjo@pywgn via the 9600b gateway aboard KO-23.
Is there someone who would care to provide a relay ?
Thanks....

93. Hubble pictures

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 09:13:35 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CJtIyo.Ay4@bbc.co.uk>
Source record: 28342

Does anyone know where I can ftp to for hubble pictures?
Please email me direct.

Regards John B.

Boyer@rd.eng.bbc.co.uk

94. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 14:37:17 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan18.143717.29911@ke4zv.atl.ga.us>
Source record: 28343
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hec4f$eqd@crocus.csv.warwick.ac.uk> esrne@csv.warwick.ac.uk (Mr P I Neaves) writes:
>
>Thats why "silicon on saphire" technology is employed in space systems and rad-hard applications.
>Prevents latchup etc.

Too bad RCA is gone. :-(

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

95. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 14:39:20 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan18.143920.29992@ke4zv.atl.ga.us>
Source record: 28344
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hecng$307@news.acns.nwu.edu> rdewan@casbah.acns.nwu.edu (Rajiv Dewan) writes:
>In article <1994Jan17.141507.24926@ke4zv.atl.ga.us>,
>Gary Coffman <gary@ke4zv.atl.ga.us> wrote:
>
>>Without ECC memory, the average laptop would likely suffer a flipped bit
>>one or more times a day. If that bit is in an active area of program memory,
>>you may have a crash. If it hits the stack, you'll almost certainly have
>>a crash.
>
>Most IBM PC clones have just a parity check. No ECC. Unless a chip is bad,
>you almost never see a memory fault.

Unless you're operating in a higher than ground level normal radiation
flux, as you are in space.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

96. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 16:42:05 UTC
From: coyne@yertle.cc.utexas.edu
Message-ID: <2hh3gt$obp@geraldo.cc.utexas.edu>
Source record: 28345
Cross-posted to: sci.electronics,rec.radio.amateur.space

>in article <1994Jan14.160430.16810@lmpsbbs.comm.mot.com> eck001@email.mot.com (Chris Kerlin) scribbles in crayon:
>At least as of a couple years ago...
>Several shuttle onboard computers made by IBM use magnetic core memory
>("beads and string") which limits the range of windspeeds that can be
>accomodated at liftoff.

I am fairly certain that these cores are not out in the wind. The shuttle was designed to a 2G acceleration limit and many of the bits are no stronger than 2G requires. The wings, which are out in the wind, are not strong enough to withstand the speeds implied by 2G acceleration from the ground.

Electronic items must be "space qualified" which is a lengthy process that insures less than leading edge technology. Space qualified parts must be fairly cosmic ray and radiation resistant which guarantees that some technology will never qualify for mission critical applications. Many manufacturers are not interested in making qualified parts because demand is rather limited.

97. c64 Tracking Program

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 17:50:48 UTC
From: ab376@FreeNet.Carleton.CA
Message-ID: <CJu6wp.IMK@freenet.carleton.ca>
Source record: 28349

Can anyone tell me the name of a good satellite tracking program for the C64?

Thanks
--
##
Mike Ligeza Snr.- VE3UIL
Ottawa, Ontario
Canada

98. Re: Hubble pictures

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 18:10:08 UTC
From: prvalko@vela.acs.oakland.edu
Message-ID: <2hh8m0$3nv@oak.oakland.edu>
Source record: 28350

```
FTP to jplinfo.jpl.nasa.gov
```

99. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-18 18:41:47 UTC
From: myers@sunspot.West.Sun.COM
Message-ID: <2hhahbINNjt@abyss.West.Sun.COM>
Source record: 28346
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hc5ct$kp1@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>Dana Myers (myers@sunspot.West.Sun.COM) wrote:
>
>: I'm sure none of us armchair designers would bother to consider that
>: core memory is considerably more immue to radiation induced errors
>: than semiconductor memory while we're re-designing the shuttle system,
>: which operate in a region of considerably higher ambient radiation
>: levels than on Earth...
>
>I spend a lot of time testing for radiated immunity (and radiated
>emissions) problems on microprocessor-based instruments. Semiconductor
>memories generally do not have immunity problems with radiated fields.
>Besides, there's hardly an EM immunity problem that a Faraday cage can't
>solve if you can constrain your system to operate in one. Memory and
>CPU certainly fit in that category. Actually, most often they ARE caged
>to constrain the EM energy their clocks produce. This radiated energy
>doesn't bother them, but rather interferes with radio recievers and
>small signal transducers.

I'm talking about atomic particles moving very rapidly; you know,
radioactivity like the kind produced by plutonium, or cosmic rays.
I'm not talking about EM radiation, like that produced by an radio
transmitter.

>The statement about ambient radiation being higher in space than on
>earth is confusing. To what radiation are you referring? Cosmic?
>Transmitters (intentional and otherwise) are responsible for nearly all
>the EM fields in the frequency range that can induce unwanted currents
>in circuits and the farther you are from the source, the smaller they are.

Right; but, as explained above, I'm talking about things like alpha
particles and stuff like that. The Earth's atmosphere shields us
from a lot of the stuff from outer space. Find someone at HP who
works on electronics for satellites and ask them about rad-hardness.

--
* Dana H. Myers KK6JQ, DoD 466 | Views expressed here are *
* (310) 348-6043 | mine and do not necessarily *
* Dana.Myers@West.Sun.Com | reflect those of my employer *
* This Extra supports the abolition of the 13 and 20 WPM tests *

100. MIR and the Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 02:27:00 UTC
From: tim.stephens@canrem.com
Message-ID: <60.1179.3291.0N191A59@canrem.com>
Source record: 28360

Hi Everyone.
I'd like to listen to the Russian MIR space station as well as the U.S. Space shuttles. I understand that MIR can be heard on 145.550, but I'd like some additional frequencies. :-)
I've been DXing for years, but I've usually limited myself to SW band stuff, so I really am new to the game of space listening. I'd be very appreciative if anyone might offer some advice on recommended receivers, frequencies, and any and all other tips you think a novice ought to know.
In addition, I'm interested in the video Xmitted by the shuttle and MIR--are any of you watching it? What equipment set up is required to see the video
I really appreciate any and all advice and comments.

101. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 06:45:27 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jan19.064527.3336@ke4zv.atl.ga.us>
Source record: 28351
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <CJsuow.J5I@cbnewsh.cb.att.com> mrb1@cbnewsh.cb.att.com (maurice.r.baker) writes:
>In article <1994Jan17.145311.25166@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>>Note, Apollo used the HP-35 calculator as backup for it's computers,
>
>Perhaps I am mistaken, but didn't the HP-35 calculator become available in 1972 ?
>Many of the Apollo flights (if not all) were over by then. Of course, there was
>still Skylab and ASTP, but I'm not sure that this is what you meant.

Yeah, ASTP, the Soviets were impressed, especially when they found out
anyone could just go into a store and buy one.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

102. Re: c64 Tracking Program

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 11:26:40 UTC
From: n4hy@wahoo.ccr-p.ida.org
Message-ID: <N4HY.94Jan19112640@wahoo.ccr-p.ida.org>
Source record: 28356

Call AMSAT, Inc. at (301)- 589- 6062.

Bob
--
Robert W. McGwier | n4hy@ccr-p.ida.org Interests: ham radio,
Center for Communications Research | scouts, astronomy, golf (o yea, & math!)
Princeton, N.J. 08520 | ASM Troop 5700, ACM Pack 53 Hightstown
(609)-279-6240(v) (609)-924-3061(f)| I used to be a Buffalo . . . NE III-120

103. 137.500.0 MHz

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 11:34:04 UTC
From: josephl@clark.net
Message-ID: <2hj5rc$p94@clarknet.clark.net>
Source record: 28352

Can someone tell me which satellites uses this frequency? evry morning
from 5 am to 9 pm ET I heard the signals from them but can not id it.

--
Joseph

104. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 16:14:41 UTC
From: rstevew@armory.com
Message-ID: <CJvx4H.2vJ@armory.com>
Source record: 28355
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <2hhahbINNjt@abyss.west.sun.com>,
Dana Myers <myers@sunspot.West.Sun.COM> wrote:
>In article <2hc5ct$kp1@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>>Dana Myers (myers@sunspot.West.Sun.COM) wrote:
>>
>>: I'm sure none of us armchair designers would bother to consider that
>>: core memory is considerably more immue to radiation induced errors
>>: than semiconductor memory while we're re-designing the shuttle system,
>>: which operate in a region of considerably higher ambient radiation
>>: levels than on Earth...
>>
>>I spend a lot of time testing for radiated immunity (and radiated
>>emissions) problems on microprocessor-based instruments. Semiconductor
>>memories generally do not have immunity problems with radiated fields.
>>Besides, there's hardly an EM immunity problem that a Faraday cage can't
>>solve if you can constrain your system to operate in one. Memory and
>>CPU certainly fit in that category. Actually, most often they ARE caged
>>to constrain the EM energy their clocks produce. This radiated energy
>>doesn't bother them, but rather interferes with radio recievers and
>>small signal transducers.
>
>I'm talking about atomic particles moving very rapidly; you know,
>radioactivity like the kind produced by plutonium, or cosmic rays.
>I'm not talking about EM radiation, like that produced by an radio
>transmitter.
>
>>The statement about ambient radiation being higher in space than on
>>earth is confusing. To what radiation are you referring? Cosmic?
>>Transmitters (intentional and otherwise) are responsible for nearly all
>>the EM fields in the frequency range that can induce unwanted currents
>>in circuits and the farther you are from the source, the smaller they are.
>
>Right; but, as explained above, I'm talking about things like alpha
>particles and stuff like that. The Earth's atmosphere shields us
>from a lot of the stuff from outer space. Find someone at HP who
>works on electronics for satellites and ask them about rad-hardness.
> * Dana.Myers@West.Sun.Com | reflect those of my employer *

Just a note. Alpha particles unless they are high energy solar won't go
through paper. Beta (electrons) won't make it through the shuttle
compartment except at monstrous temperatures (speeds). The only thing left
is the solar wind, shielded as we are in low orbit by the Van Allen belts,
and cosmic rays, which do pass all the way through the earth! Some of them!

The solar flux that is lower in velocity is responsible for most excess computer errors. Also, let us remember that the shuttle equipment may produce high DC magnetic fields from some equipment. These are NOT shielded by EM Faraday cages, and can go through even sheet steel! If you have some ferrite beads for memory, one good mag pulse can wipe them inside anything. But they are probably more immune or else better proven and reliable. I have a board out of a DEC that is 8K x 16 and it is 7" by 10" in area and I haven't the vaguest idea where they got the people to do all that under a microsope! They must have used #48 gauge wire!!! Can't even see the beads without a microscope!
-Steve Walz rstevew@armory.com

105. Re: 137.500.0 MHz

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 22:00:27 UTC
From: cochrane@netcom.com
Message-ID: <cochraneCJwD4s.DuL@netcom.com>
Source record: 28358

Joseph A. Liu (josephl@clark.net) wrote:
: Can someone tell me which satellites uses this frequency? evry morning
: from 5 am to 9 pm ET I heard the signals from them but can not id it.

: --
: Joseph

The satellites you are receiving are weather satellites NOAA-10 and I think
NOAA-13. The audio you hear is the picture being transmitted. I have
a system connected to my PC to display this info. There is a book
called Weather Satellite Handbook by Dr. Ralph Taggart that
descibes this system. You can buy this book at a local Ham Radio
Store.
Larry Cochrane

106. Daily IPS Report - 20 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-19 23:18:20 UTC
From: dave@eram.esi.com.au
Message-ID: <5126@eram.esi.com.au>
Source record: 28162
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 19 January 1994
Summary for 19 January and Forecast up to 22 January
No warning is current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 103/052

1B. SOLAR FORECAST
20 January 21 January 22 January
Activity Low to moderate Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 105/054

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : mostly unsettled with a minor storm
period during local night.

Estimated Indices : A K Observed A Index 18 January
Learmonth 19 3433 5233
Fredericksburg 19 21
Planetary 23 22

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
20 Jan 20 Unsettled to active.
21 Jan 20 Unsettled to active.
22 Jan 20 Unsettled to active.

2C. MAGNETIC COMMENT
Enhanced levels of geomagnetic activity are expected to persist
for next three days. This activity has been ongoing since 15UT on
the 11th January. A small isolated equatorial coronal hole is
visible at the centre of the solar disk. As this hole is small,
geomagnetic activity levels are not expected to increase beyond
current levels.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
19 Jan normal normal fair-normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
20 Jan normal fair poor
21 Jan normal fair poor
22 Jan normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Continuing geomagnetic activity at high and middle lats has degraded
hf propagation conditions recently. Degraded conditions are expected
to continue at high and middle lats over the next three days.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were slightly below predicted monthly values

T index: 25

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
20 Jan 20 About 10% below predicted monthly values.
21 Jan 20 About 10% below predicted monthly values.
22 Jan 20 About 10% below predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
East coast propagation conditions may have been degraded yesterday
due to the regular appearance of Sporadic E layer and occasional
Spread F. Similar conditions are expected for today.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

107. Re: 137.500.0 MHz

Newsgroup: rec.radio.amateur.space
Date: 1994-01-20 10:13:00 UTC
From: peter.henne@gmd.de
Message-ID: <1994Jan20.101300.29082@gmd.de>
Source record: 28359

In article <2hj5rc$p94@clarknet.clark.net>, josephl@clark.net
(Joseph A. Liu) writes:
>
> Can someone tell me which satellites uses this frequency? evry morning
> from 5 am to 9 pm ET I heard the signals from them but can not id it.
>
> --
> Joseph
>
This is APT (Automatic Picture Transmission) from weather-satellites
NOAA-10 and NOAA-12

Regards
Peter

+--+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-5205 St.AUGUSTIN 1 |
|Fed.Rep. of Germany |
+--+

108. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-20 15:05:01 UTC
From: dbraun@ilx049.intel.com
Message-ID: <2hm6it$1jnq@ilx018.intel.com>
Source record: 28161
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <qe99Fc2w165w@jackatak.raider.net>, root@jackatak.raider.net (Jack GF Hill) writes:

|> The core memeroy has several advantages over solid-state, not the
|> least of which is that if power is lost, for whatever reason, the
|> memory holds whatever settings it had...for longer than a UPS will
|> hold CMOS... Hollow-state is not suseptible to Ultra-violet erasure,

Really? The one or two CMOS chips that could replace the core memory could be backup-powered for at least a year by a lithium battery the size of a quarter..

UV erasure is not a problem if chips are packaged...

Doug Braun Intel Israel, Ltd. M/S: IDC-42 (new mailstop!)
Tel: 011-972-4-655069 dbraun@inside.intel.com

109. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-20 20:30:23 UTC
From: ebuhcb@EBU.Ericsson.SE
Message-ID: <1994Jan20.203023.13353@exu.ericsson.se>
Source record: 28163

In article 1jnq@ilx018.intel.com, dbraun@ilx049.intel.com (Doug Braun) writes:
>Really? The one or two CMOS chips that could replace the core memory
>could be backup-powered for at least a year by a lithium battery the size
>of a quarter..

But hey.. it costs a fortune to replace that battery!

110. HELP:Trouble with TRACKSAT 3.00 !

Newsgroup: rec.radio.amateur.space
Date: 1994-01-20 22:43:57 UTC
From: gerca@lysator.liu.se
Message-ID: <CJy9tB.LAM@lysator.liu.se>
Source record: 28164

I need help with the following problem;

I have obtained the latest tle.txt file from the ftp server mentioned in the documentation. When I exchange the old file with the new one TRAKSAT hangs up and nothing is displayed except the mouse cursor, which still works, and the menu screen. I can't choose any of the menu alternatives. When I start TRAKSAT with the /x switch the program starts up but when I tree to read the TLE.TXT file it crashes and displays;

RUNTIME ERROR 6806 Can not read file !

Does anyone have a solution to this ?

Thank you in advance,

Gert E B Carlsson, SM5LWC

E-mail: gerca@lysator.liu.se
Lysator Academic Computer Club, Linkoping University & Institute of Technology

111. Daily IPS Report - 21 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 01:10:41 UTC
From: dave@eram.esi.com.au
Message-ID: <5130@eram.esi.com.au>
Source record: 28165
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 20 January 1994
Summary for 20 January and Forecast up to 23 January
No warning is current.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 105/054

1B. SOLAR FORECAST
21 January 22 January 23 January
Activity Low to moderate Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 105/054

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled

Estimated Indices : A K Observed A Index 19 January
Learmonth 12 3223 3332
Fredericksburg 10 21
Planetary 12 22

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
21 Jan 15 Unsettled.
22 Jan 20 Unsettled to active.
23 Jan 20 Unsettled to active.

2C. MAGNETIC COMMENT
Active periods expected 22-23 due to small coronal hole. Another
coronal hole has returned to the east, and will probably increase
geomagnetic activity during 27-29 Feb.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

20 Jan normal normal normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
21 Jan normal normal fair
22 Jan normal fair poor
23 Jan normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values

T index: 29

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
21 Jan 25 Near predicted monthly values.
22 Jan 25 Near predicted monthly values.
23 Jan 25 Near predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
East coast propagation conditions may have been degraded yesterday
due to the regular appearance of Sporadic E layer and occasional
Spread F. Similar conditions are expected for today.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

112. Weekly IPS Report - 21 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 01:11:48 UTC
From: dave@eram.esi.com.au
Message-ID: <5131@eram.esi.com.au>
Source record: 28166
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

14 JANUARY - 20 JANUARY 1994

Issue No 03
Date of issue: 21 January, 1994

INDICES:
Date 14 15 16 17 18 19 20
10cm 090 096 100 105 101 103 105
A 18 18 14 23 21 21 (10)
T 63 42 11 41 59 25 29

SUMMARY OF ACTIVITY

January 14
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled to active.
Ionospheric F2 critical frequencies at Sydney were slightly above
predicted monthly values.

January 15
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled to active.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values 00-10UT, subject to severe Sporadic E layer and Spread
F 11-18UT, and 10-20% depressed from 19UT onwards.

January 16
Solar activity was high, with an M6.1/1N at 2325UT.
The geomagnetic field at Learmonth (WA) was unsettled.
Ionospheric F2 critical frequencies at Sydney were up to 15% below
predicted monthly values, apart from Sporadic E layer blanketing
09UT, 13-17UT, and from 21UT onwards.

January 17
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was mostly unsettled.
Ionospheric F2 critical frequencies at Sydney were blanketed by
Sporadic E layer 00-01UT, 08-12UT, 14UT, 16-18UT, and from 21UT
onwards. Near predicted monthly values at other times.

.SK
January 18
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was mostly unsettled.
Ionospheric F2 critical frequencies at Sydney were 15-30% enhanced
00-02 and 04-09UT, and otherwise near predicted monthly values, apart

from Sporadic E blanketing 03, 10-11, 21 and 23UT.

January 19
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was mostly unsettled with a
minor storm period during local night.
Ionospheric F2 critical frequencies at Sydney were slightly below
predicted monthly values.

January 20
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values.

Comment:
Spoardic E was often observed this week. HF conditions may have
been degraded due to mild geomagnetic activity which has more or
less persisted since January the 11th. The source of this enhanced
geomagnetic activity is thought to be a broad south polar coronal
hole.

FORECAST FOR THE NEXT WEEK (21 - 27 JANUARY)

SOLAR: low, chance for isolated low level M class flare.

GEOMAGNETIC: mostly unsettled with active period expected
during January 22-23 and January 27-29. (Coronal holes).

IONOSPHERIC: propagation conditions are expected to be fair,
with degradations expected on January 22,23 and 27 to 29.

IPS Monthly Predicted Smoothed T-indices
YEAR JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
==
1994 34 33 33 34 31 29 27 24 22 21 19
1995 19 18 17 16 15 14 14 13 12 11 11 10
1996 10 9 9 8 8 7 8 8 9 10 11 12
1997 13 14 16 18 20 22 25 28 32 35 40 46
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

113. 137.500.0 MHz

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 09:25:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.251.1818.0NC5C39B@compart.fi>
Source record: 28176

-> Can someone tell me which satellites uses this frequency? evry
-> morning from 5 am to 9 pm ET I heard the signals from them but can
-> not id it.

Polar-orbiting weather satellites like NOAA 10 and NOAA 12 are using
this frequency. NOAA 13 is not active.

Leo Wikholm

114. ORBS$021.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 13:56:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-021.o.1994@ampr.org>
Source record: 28171
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-021.O
Orbital Elements 021.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SAT
FROM WA5QGD FORT WORTH,TX January 21, 1994
BID: $ORBS-021.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94012.88782746
Element set: 252
Inclination: 27.1999 deg
RA of node: 346.8463 deg
Eccentricity: 0.6020165
Arg of perigee: 145.8302 deg
Mean anomaly: 274.3239 deg
Mean motion: 2.05879874 rev/day
Decay rate: -3.37e-06 rev/day^2
Epoch rev: 7958
Checksum: 340

Satellite: UO-11
Catalog number: 14781
Epoch time: 94018.53148342
Element set: 658
Inclination: 97.7944 deg
RA of node: 40.2143 deg
Eccentricity: 0.0012903
Arg of perigee: 32.0480 deg
Mean anomaly: 328.1509 deg
Mean motion: 14.69124335 rev/day
Decay rate: 2.35e-06 rev/day^2
Epoch rev: 52833
Checksum: 287

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94016.19941791
Element set: 854
Inclination: 82.9244 deg
RA of node: 81.1944 deg
Eccentricity: 0.0013211
Arg of perigee: 85.2443 deg
```

Mean anomaly: 275.0217 deg
Mean motion: 13.72329684 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 32906
Checksum: 302

Satellite: AO-13
Catalog number: 19216
Epoch time: 94013.76090682
Element set: 865
Inclination: 57.8727 deg
RA of node: 273.6690 deg
Eccentricity: 0.7205576
Arg of perigee: 332.7751 deg
Mean anomaly: 3.3757 deg
Mean motion: 2.09726934 rev/day
Decay rate: -5.86e-06 rev/day^2
Epoch rev: 4277
Checksum: 343

Satellite: FO-20
Catalog number: 20480
Epoch time: 94018.51659842
Element set: 652
Inclination: 99.0147 deg
RA of node: 198.7340 deg
Eccentricity: 0.0540754
Arg of perigee: 318.6667 deg
Mean anomaly: 37.4685 deg
Mean motion: 12.83223815 rev/day
Decay rate: 1.00e-06 rev/day^2
Epoch rev: 18493
Checksum: 319

Satellite: AO-21
Catalog number: 21087
Epoch time: 94019.17209926
Element set: 417
Inclination: 82.9424 deg
RA of node: 252.9794 deg
Eccentricity: 0.0035743
Arg of perigee: 137.1749 deg
Mean anomaly: 223.2201 deg
Mean motion: 13.74532086 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 14911
Checksum: 304

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94018.81286753

```
Element set: 656
Inclination: 82.9239 deg
RA of node: 122.2331 deg
Eccentricity: 0.0029532
Arg of perigee: 161.6651 deg
Mean anomaly: 198.5573 deg
Mean motion: 13.74033348 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 14813
Checksum: 312

/EX
```

115. ORBS$021.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 13:59:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-021.d.1994@ampr.org>
Source record: 28173
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-021.D
Orbital Elements 021.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX January 21, 1994
BID: $ORBS-021.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94019.24162783
Element set: 957
Inclination: 98.6014 deg
RA of node: 105.9995 deg
Eccentricity: 0.0010476
Arg of perigee: 271.0915 deg
Mean anomaly: 88.9061 deg
Mean motion: 14.29817627 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 20830
Checksum: 322

Satellite: AO-16
Catalog number: 20439
Epoch time: 94019.23294962
Element set: 758
Inclination: 98.6092 deg
RA of node: 107.0729 deg
Eccentricity: 0.0010727
Arg of perigee: 271.4260 deg
Mean anomaly: 88.5694 deg
Mean motion: 14.29873575 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 20831
Checksum: 327

Satellite: DO-17
Catalog number: 20440
Epoch time: 94018.78193383
Element set: 757
Inclination: 98.6093 deg
RA of node: 106.8996 deg
Eccentricity: 0.0010796
Arg of perigee: 272.2002 deg
```

Mean anomaly: 87.7944 deg
Mean motion: 14.30011640 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 20826
Checksum: 311

Satellite: WO-18
Catalog number: 20441
Epoch time: 94019.24446275
Element set: 758
Inclination: 98.6091 deg
RA of node: 107.3686 deg
Eccentricity: 0.0011348
Arg of perigee: 270.7621 deg
Mean anomaly: 89.2257 deg
Mean motion: 14.29988067 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 20833
Checksum: 322

Satellite: LO-19
Catalog number: 20442
Epoch time: 94019.23252273
Element set: 757
Inclination: 98.6097 deg
RA of node: 107.5781 deg
Eccentricity: 0.0011714
Arg of perigee: 270.9464 deg
Mean anomaly: 89.0376 deg
Mean motion: 14.30081798 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 20834
Checksum: 318

Satellite: UO-22
Catalog number: 21575
Epoch time: 94018.70071175
Element set: 458
Inclination: 98.4490 deg
RA of node: 96.1200 deg
Eccentricity: 0.0008373
Arg of perigee: 21.0530 deg
Mean anomaly: 339.1000 deg
Mean motion: 14.36883323 rev/day
Decay rate: 1.04e-06 rev/day^2
Epoch rev: 13161
Checksum: 259

Satellite: KO-23
Catalog number: 22077
Epoch time: 94015.07021241

Element set: 352
Inclination: 66.0872 deg
RA of node: 240.5682 deg
Eccentricity: 0.0008534
Arg of perigee: 325.9559 deg
Mean anomaly: 34.0911 deg
Mean motion: 12.86283203 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 6709
Checksum: 280

Satellite: AO-27
Catalog number: 22825
Epoch time: 94015.23688085
Element set: 254
Inclination: 98.6695 deg
RA of node: 92.4839 deg
Eccentricity: 0.0008356
Arg of perigee: 301.9653 deg
Mean anomaly: 58.0715 deg
Mean motion: 14.27601623 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 1586
Checksum: 323

Satellite: IO-26
Catalog number: 22826
Epoch time: 94015.22892069
Element set: 255
Inclination: 98.6706 deg
RA of node: 92.4916 deg
Eccentricity: 0.0008734
Arg of perigee: 301.5136 deg
Mean anomaly: 58.5191 deg
Mean motion: 14.27703814 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 1586
Checksum: 313

Satellite: KO-25
Catalog number: 22830
Epoch time: 94014.64339549
Element set: 256
Inclination: 98.5722 deg
RA of node: 90.7900 deg
Eccentricity: 0.0010843
Arg of perigee: 268.6528 deg
Mean anomaly: 91.3411 deg
Mean motion: 14.28027124 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 1578

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Checksum: 291

/EX
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116. ORBS$021.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 14:02:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-021.w.1994@ampr.org>
Source record: 28174
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-021.W
Orbital Elements 021.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SAT
FROM WA5QGD FORT WORTH,TX January 21, 1994
BID: $ORBS-021.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94014.01154683
Element set: 677
Inclination: 99.0744 deg
RA of node: 62.5335 deg
Eccentricity: 0.0014570
Arg of perigee: 297.2963 deg
Mean anomaly: 62.6724 deg
Mean motion: 14.13579715 rev/day
Decay rate: 1.35e-06 rev/day^2
Epoch rev: 46856
Checksum: 324

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94013.95089539
Element set: 576
Inclination: 98.5115 deg
RA of node: 27.6470 deg
Eccentricity: 0.0014289
Arg of perigee: 60.6937 deg
Mean anomaly: 299.5669 deg
Mean motion: 14.24857313 rev/day
Decay rate: 8.5e-07 rev/day^2
Epoch rev: 38064
Checksum: 354

Satellite: MET
Catalog number: 18820
Epoch time: 94019.09840418
Element set: 255
Inclination: 82.5397 deg
RA of node: 27.1822 deg
Eccentricity: 0.0015166
Arg of perigee: 239.2617 deg
```

Mean anomaly: 120.7049 deg
Mean motion: 13.84704972 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 30172
Checksum: 300

Satellite: MET
Catalog number: 19336
Epoch time: 94018.57372231
Element set: 257
Inclination: 82.5389 deg
RA of node: 69.5600 deg
Eccentricity: 0.0015877
Arg of perigee: 278.6887 deg
Mean anomaly: 81.2437 deg
Mean motion: 13.16963263 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26356
Checksum: 332

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94013.91338651
Element set: 478
Inclination: 99.1575 deg
RA of node: 359.1629 deg
Eccentricity: 0.0011211
Arg of perigee: 204.5750 deg
Mean anomaly: 155.4889 deg
Mean motion: 14.12949930 rev/day
Decay rate: 1.26e-06 rev/day^2
Epoch rev: 27343
Checksum: 313

Satellite: MET
Catalog number: 19851
Epoch time: 94019.18866258
Element set: 256
Inclination: 82.5226 deg
RA of node: 262.7081 deg
Eccentricity: 0.0013229
Arg of perigee: 289.3306 deg
Mean anomaly: 70.6423 deg
Mean motion: 13.84355686 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 24707
Checksum: 331

Satellite: MET
Catalog number: 20305
Epoch time: 94017.89422067

Element set: 971
Inclination: 82.5495 deg
RA of node: 13.8911 deg
Eccentricity: 0.0005906
Arg of perigee: 311.7262 deg
Mean anomaly: 48.3353 deg
Mean motion: 13.04401542 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 20330
Checksum: 267

Satellite: MET
Catalog number: 20670
Epoch time: 94019.25203231
Element set: 757
Inclination: 82.5477 deg
RA of node: 326.7663 deg
Eccentricity: 0.0014849
Arg of perigee: 201.4548 deg
Mean anomaly: 158.5995 deg
Mean motion: 13.84186662 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18001
Checksum: 317

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94016.17645587
Element set: 873
Inclination: 98.8459 deg
RA of node: 41.1276 deg
Eccentricity: 0.0015374
Arg of perigee: 75.7420 deg
Mean anomaly: 284.3802 deg
Mean motion: 14.01335636 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 17241
Checksum: 313

Satellite: MET
Catalog number: 20826
Epoch time: 94019.19169044
Element set: 756
Inclination: 82.5267 deg
RA of node: 264.5225 deg
Eccentricity: 0.0014575
Arg of perigee: 102.3761 deg
Mean anomaly: 257.9031 deg
Mean motion: 13.83571054 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16715

Checksum: 303

Satellite: MET
Catalog number: 21232
Epoch time: 94016.77549633
Element set: 664
Inclination: 82.5405 deg
RA of node: 276.6395 deg
Eccentricity: 0.0012441
Arg of perigee: 202.6707 deg
Mean anomaly: 157.3867 deg
Mean motion: 13.16458614 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 13143
Checksum: 299

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94015.96922581
Element set: 886
Inclination: 98.6363 deg
RA of node: 46.9897 deg
Eccentricity: 0.0012686
Arg of perigee: 321.9099 deg
Mean anomaly: 38.1181 deg
Mean motion: 14.22357548 rev/day
Decay rate: 1.57e-06 rev/day^2
Epoch rev: 13889
Checksum: 349

Satellite: MET
Catalog number: 21655
Epoch time: 94018.52836753
Element set: 660
Inclination: 82.5520 deg
RA of node: 222.4234 deg
Eccentricity: 0.0012361
Arg of perigee: 209.0115 deg
Mean anomaly: 151.0325 deg
Mean motion: 13.16826870 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 11676
Checksum: 269

Satellite: MET
Catalog number: 22782
Epoch time: 94018.89845223
Element set: 256
Inclination: 82.5520 deg
RA of node: 324.7383 deg
Eccentricity: 0.0021299

```
Arg of perigee: 286.9901 deg
Mean anomaly: 72.8924 deg
Mean motion: 13.82996980 rev/day
Decay rate: 3.9e-07 rev/day^2
Epoch rev: 1945
Checksum: 341

/EX
```

117. ORBS$021.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 14:04:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-021.m.1994@ampr.org>
Source record: 28170
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-021.M
Orbital Elements 021.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SAT
FROM WA5QGD FORT WORTH,TX January 21, 1994
BID: $ORBS-021.M
TO ALL RADIO AMATEURS BT

Satellite: MIR
Catalog number: 16609
Epoch time: 94017.58944630
Element set: 99
Inclination: 51.6174 deg
RA of node: 222.2409 deg
Eccentricity: 0.0004684
Arg of perigee: 210.2206 deg
Mean anomaly: 149.8392 deg
Mean motion: 15.59692386 rev/day
Decay rate: 9.870e-05 rev/day^2
Epoch rev: 45255
Checksum: 323

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94019.23512510
Element set: 429
Inclination: 28.4680 deg
RA of node: 112.6612 deg
Eccentricity: 0.0005975
Arg of perigee: 331.6281 deg
Mean anomaly: 28.3980 deg
Mean motion: 14.90430063 rev/day
Decay rate: 8.38e-06 rev/day^2
Epoch rev: 714
Checksum: 269

Satellite: GRO
Catalog number: 21225
Epoch time: 94017.58973420
Element set: 56
Inclination: 28.4617 deg
RA of node: 196.8700 deg
Eccentricity: 0.0003735
Arg of perigee: 311.7439 deg
```

Mean anomaly: 48.2817 deg
Mean motion: 15.39842307 rev/day
Decay rate: 3.648e-05 rev/day^2
Epoch rev: 3369
Checksum: 309

Satellite: UARS
Catalog number: 21701
Epoch time: 94018.13837617
Element set: 464
Inclination: 56.9833 deg
RA of node: 40.3077 deg
Eccentricity: 0.0005136
Arg of perigee: 99.2913 deg
Mean anomaly: 260.8424 deg
Mean motion: 14.96334028 rev/day
Decay rate: -1.27e-06 rev/day^2
Epoch rev: 12847
Checksum: 294

Satellite: POSAT
Catalog number: 22829
Epoch time: 94015.20627603
Element set: 247
Inclination: 98.6671 deg
RA of node: 92.4771 deg
Eccentricity: 0.0009664
Arg of perigee: 287.5870 deg
Mean anomaly: 72.4206 deg
Mean motion: 14.27996968 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 1586
Checksum: 331

/EX

118. ORBS$021.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 14:07:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-021.n.1994@ampr.org>
Source record: 28175
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-021.N
2Line Orbital Elements 021.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SAT
FROM WA5QGD FORT WORTH,TX January 21, 1994
BID: $ORBS-021.N

DECODE 2-LINE ELSETS WIT
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94012.88782746 -.00000337 00000-0 10000-3 0 2527
2 14129 27.1999 346.8463 6020165 145.8302 274.3239 2.05879874 79582
UO-11
1 14781U 84021B 94018.53148342 .00000235 00000-0 47829-4 0 6584
2 14781 97.7944 40.2143 0012903 32.0480 328.1509 14.69124335528336
RS-10/11
1 18129U 87054A 94016.19941791 .00000046 00000-0 34288-4 0 8545
2 18129 82.9244 81.1944 0013211 85.2443 275.0217 13.72329684329062
AO-13
1 19216U 88051B 94013.76090682 -.00000586 00000-0 10000-4 0 8653
2 19216 57.8727 273.6690 7205576 332.7751 3.3757 2.09726934 42777
FO-20
1 20480U 90013C 94018.51659842 .00000100 00000-0 30329-3 0 6526
2 20480 99.0147 198.7340 0540754 318.6667 37.4685 12.83223815184933
AO-21
1 21087U 91006A 94019.17209926 .00000094 00000-0 82657-4 0 4173
2 21087 82.9424 252.9794 0035743 137.1749 223.2201 13.74532086149118
RS-12/13
1 21089U 91007A 94018.81286753 .00000037 00000-0 23432-4 0 6567
2 21089 82.9239 122.2331 0029532 161.6651 198.5573 13.74033348148137
UO-14
1 20437U 90005B 94019.24162783 .00000048 00000-0 35626-4 0 9578
2 20437 98.6014 105.9995 0010476 271.0915 88.9061 14.29817627208309
AO-16
1 20439U 90005D 94019.23294962 .00000043 00000-0 33605-4 0 7583
2 20439 98.6092 107.0729 0010727 271.4260 88.5694 14.29873575208314
DO-17
1 20440U 90005E 94018.78193383 .00000055 00000-0 38411-4 0 7571
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2 20440 98.6093 106.8996 0010796 272.2002 87.7944 14.30011640208261
WO-18
1 20441U 90005F 94019.24446275 .00000032 00000-0 29435-4 0 7587
2 20441 98.6091 107.3686 0011348 270.7621 89.2257 14.29988067208332
LO-19
1 20442U 90005G 94019.23252273 .00000048 00000-0 35616-4 0 7574
2 20442 98.6097 107.5781 0011714 270.9464 89.0376 14.30081798208349
UO-22
1 21575U 91050B 94018.70071175 .00000104 00000-0 49885-4 0 4588
2 21575 98.4490 96.1200 0008373 21.0530 339.1000 14.36883323131615
KO-23
1 22077U 92052B 94015.07021241 -.00000037 00000-0 10000-3 0 3520
2 22077 66.0872 240.5682 0008534 325.9559 34.0911 12.86283203 67099
AO-27
1 22825U 93061C 94015.23688085 .00000036 00000-0 32631-4 0 2549
2 22825 98.6695 92.4839 0008356 301.9653 58.0715 14.27601623 15866
IO-26
1 22826U 93061D 94015.22892069 .00000038 00000-0 33169-4 0 2558
2 22826 98.6706 92.4916 0008734 301.5136 58.5191 14.27703814 15866
KO-25
1 22830U 93061H 94014.64339549 .00000001 00000-0 18008-4 0 2563
2 22830 98.5722 90.7900 0010843 268.6528 91.3411 14.28027124 15789
NOAA-9
1 15427U 84123A 94014.01154683 .00000135 00000-0 95826-4 0 6779
2 15427 99.0744 62.5335 0014570 297.2963 62.6724 14.13579715468562
NOAA-10
1 16969U 86073A 94013.95089539 .00000085 00000-0 54705-4 0 5769
2 16969 98.5115 27.6470 0014289 60.6937 299.5669 14.24857313380648
MET-2/17
1 18820U 88005A 94019.09840418 .00000041 00000-0 23323-4 0 2554
2 18820 82.5397 27.1822 0015166 239.2617 120.7049 13.84704972301727
MET-3/2
1 19336U 88064A 94018.57372231 .00000051 00000-0 10000-3 0 2577
2 19336 82.5389 69.5600 0015877 278.6887 81.2437 13.16963263263566
NOAA-11
1 19531U 88089A 94013.91338651 .00000126 00000-0 92509-4 0 4785
2 19531 99.1575 359.1629 0011211 204.5750 155.4889 14.12949930273432
MET-2/18
1 19851U 89018A 94019.18866258 .00000069 00000-0 48247-4 0 2567
2 19851 82.5226 262.7081 0013229 289.3306 70.6423 13.84355686247076
MET-3/3
1 20305U 89086A 94017.89422067 .00000044 00000-0 10000-3 0 9712
2 20305 82.5495 13.8911 0005906 311.7262 48.3353 13.04401542203308
MET-2/19
1 20670U 90057A 94019.25203231 .00000024 00000-0 79036-5 0 7575
2 20670 82.5477 326.7663 0014849 201.4548 158.5995 13.84186662180010
FY-1/2
1 20788U 90081A 94016.17645587 -.00000027 00000-0 10000-4 0 8732
2 20788 98.8459 41.1276 0015374 75.7420 284.3802 14.01335636172410
MET-2/20
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1 20826U 90086A 94019.19169044 .00000094 00000-0 71590-4 0 7568
2 20826 82.5267 264.5225 0014575 102.3761 257.9031 13.83571054167152
MET-3/4
1 21232U 91030A 94016.77549633 .00000050 00000-0 10000-3 0 6645
2 21232 82.5405 276.6395 0012441 202.6707 157.3867 13.16458614131438
NOAA-12
1 21263U 91032A 94015.96922581 .00000157 00000-0 90208-4 0 8861
2 21263 98.6363 46.9897 0012686 321.9099 38.1181 14.22357548138892
MET-3/5
1 21655U 91056A 94018.52836753 .00000051 00000-0 10000-3 0 6606
2 21655 82.5520 222.4234 0012361 209.0115 151.0325 13.16826870116763
MET-2/21
1 22782U 93055A 94018.89845223 .00000039 00000-0 21950-4 0 2565
2 22782 82.5520 324.7383 0021299 286.9901 72.8924 13.82996980 19459
MIR
1 16609U 86017A 94017.58944630 .00009870 00000-0 12730-3 0 995
2 16609 51.6174 222.2409 0004684 210.2206 149.8392 15.59692386452555
HUBBLE
1 20580U 90037B 94019.23512510 .00000838 00000-0 68854-4 0 4298
2 20580 28.4680 112.6612 0005975 331.6281 28.3980 14.90430063 7146
GRO
1 21225U 91027B 94017.58973420 .00003648 00000-0 82854-4 0 566
2 21225 28.4617 196.8700 0003735 311.7439 48.2817 15.39842307 33692
UARS
1 21701U 91063B 94018.13837617 -.00000127 00000-0 10000-4 0 4641
2 21701 56.9833 40.3077 0005136 99.2913 260.8424 14.96334028128474
POSAT
1 22829U 93061G 94015.20627603 .00000045 00000-0 36004-4 0 2479
2 22829 98.6671 92.4771 0009664 287.5870 72.4206 14.27996968 15866
/EX
```

119. LARC VP2E DXpedition '94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 16:10:09 UTC
From: jimkelly@astro.ocis.temple.edu
Message-ID: <1994Jan21.161009.23927@cronkite.ocis.temple.edu>
Source record: 28169

FOR RELEASE 1 JANUARY 1994

For more information contact: Jim Kelly, KK3K (215) 978-5272

LARC Announces DXpedition to VP2E

The Lambda Amateur Radio Club (LARC), an international club for gay, lesbian, bisexual, transgendered hams, shortwave listeners and computer enthusiasts and their friends and supporters, will sponsor it's third DXpedition in March 1994 with LARC members planning to operate on HF and OSCAR-13 Mode B and Mode S from the Caribbean island of Anguilla, British West Indies. The team of operators and equipment are planning to be on the air March 5-10, 1994.

Planned operations will include multi-band and multi-mode HF and OSCAR-13 Mode B and Mode S. This may be the first OSCAR-13 Mode S DXpedition for the record books.

The operators making the trip will be Jim Kelly (KK3K), Don Bledsoe (WB6LYI), Mark Wilcox (KC3XC), Tom Hendrix (KI4ZN), Howard Wyman (W9BVD), Norm Gray (KF7IK), James Keeth (AF9A), and Wayne Schuler (AI9Q). QSL for all operators is direct to current Callbook addresses only.

In March 1992, LARC sponsored OSCAR-13 Mode B DXpeditions to Anguilla, British West Indies (VP2E) and Tortola, British Virgin Islands (VP2V) and logged over 900 contacts.

In March 1993, a second team of five LARC operators put the island nation of Montserrat (VP2M) on OSCAR-13 Mode B and logged over 1150 contacts.

To make contacting the LARC VP2E DXpedition even more exciting, the club will automatically mail an engraved certificate to every station who successfully works either any HF operator and any OSCAR-13 operator OR any OSCAR-13 Mode B operator and any OSCAR-13 Mode S operator during the DXpedition.

The club has members in nine countries and local chapters around the United States. For membership information, write the Lambda Amateur Radio Club International Headquarters, P.O. Box 24810, Philadelphia, PA, USA, or call (215) 978-5272.

--
Jim Kelly, Amateur Radio Licensee KK3K (jimkelly@astro.ocis.temple.edu)
M.A. Candidate - Political Science - Temple University \

```
President - Lambda Amateur Radio Club for Sexual Minorities \
Standard Disclaimers Apply - LARC info: (215) 978 - LARC / \
************************************************** / \
```

120. * SpaceNews 24-Jan-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 20:59:50 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0124.1994@ampr.org>
Source record: 28168
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0124
* SpaceNews 24-Jan-94 *

BID: $SPC0124

=========
SpaceNews
=========

MONDAY JANUARY 24, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* STS-60 AST
==========
Astronauts Charles F. Bolden, Jr. of Columbia, South Carolina and Ronald M. Sega of Seabrook, Texas, have been issued amateur radio call signs in preparation for their joint U.S.-Russia science mission. The Spacehab science objectives are primarily micro-gravity oriented with emphasis on materials and life science.

Bolden, KE4IQB is commander of the space shuttle Discovery (OV-103) due for lift off on February 3, 1994, at 12:10 UTC from Cape Kennedy. Sega (now KC5ETH) is the second of four Mission Specialists. They plan to contact several schools as part of the SAREX program - including one in Russia.

The flight of STS-60 represents an historic first, the first of several joint U.S.-Russian Space Shuttle flights planned in preparation for the development of the international Space Station. Veteran cosmonaut Sergei Krikalev, U5MIR, was chosen to be the first Russian to fly on the U.S. Space Shuttle. During the 8 day flight, Cosmonaut Krikalev will support the science operations on the Space Shuttle as Mission Specialist 4.

Last year, Sergei attended the Dallas Ham-Com convention and told us he would try to qualify for a U.S. license - but his training duties have prevented him from doing so. Since no reciprocal operating privileges exist between Russia and the United States, Sergei will operate amateur radio under Bolden's control operator authority. The possibility also exists for the first U.S. Space Shuttle to Mir Space Station (Russian astronaut-to-Russian cosmonaut) amateur radio contact!

Three new Russian amateurs were launched on January 8, 1994 aboard a Soyuz rocket and docked at the MIR space station on January 10th. The new crew includes Viktor Afanasiev (commander) U9MIR, Yuri Usachev (flight engineer) R3MIR and Valerij Polyakov (doctor) U3MIR. They are using the call sign

R0MIR on packet.

[Info via Fred, W5YI]

* FUJI-FAX *
============
With the Fuji-OSCAR-20 satellite schedule providing extended periods of analog (Mode JA) transponder operation, Ted (G6HMS) and Ian (G0NKA) in England have been exchanging FAX images through this satellite.

At first, the technique was a bit "iffy", but Ted and Ian gradually got the hang of following the doppler on the downlink to hold the picture. Unlike voice transmissions where the ear is relatively tolerant of frequency change, the same cannot be said for computers decoding FAX signals.

Ted and Ian initially started out exchanging black and white images with no grey scale. After correcting some transmission problems, images containing 256 grey levels were exchanged, and finally FULL COLOR FAX images were exchanged!

Ted and Ian used JV-FAX 6.0 software for making FAX transmissions, and a Shareware version of Microfax on receive. Both stations used an uplink on 145.980 MHz (LSB) which produced an FO-20 downlink on 435.820 MHz (USB).

If you have FAX capability, you are asked to join Ted and Ian as they exchange FAX images through the FO-20 satellite.

[Info via Ian, G0NKA @ GB7DTX.GBR.EU]

* SUPERBALL 1-94 UPDATE *
=========================
The attempt to recover the SuperBall 1-94 balloon and payload on Saturday 15-Jan-94 failed. Numerous troubles plagued the effort and they basically just ran out of day-light and had to turn back. Another attempt was made on the 16th) which was successful! All of the critical elements of the craft were recovered.

Preliminary reports indicate that another launch will take place in about a month's time.

[Info via Kris Nosack, N7SHV]

* STS-60 SAREX INFO *
====================
Mission: STS-60 Space Shuttle Discovery
Vehicle: OV-103/Discovery
Wake Shield Facility & Spacehab-2 Mission
Launch: February 3, 1994, 12:10 UTC from KSC Pad A
Landing site: KSC
Orbit: 57 degree inclination
Orbital altitude: 218 sm
Mission Length: 8 days (Nominal)
Crew size: 6

Amateur Radio Operators: Charlie Bolden (License Pending), Ron Sega
(License Pending), Sergei Krikalev, U5MIR

Modes: FM Voice
Prime callsign: To be provided once Commander Bolden's callsign is known

Packet Radio: Callsign W5RRR-1

Frequencies: All operations in split mode. Do not transmit on
the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks: 144.91, 144.93, 144.95, 144.97,
144.99 MHz (Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: The crew will not favor any specific uplink frequency, so your ability
to work the crew will be the "luck of the draw."

Packet Freqs: Downlink: 145.55 MHz
Uplink: 144.49 MHz

[Info via KA3HDO]

* FO-20 OPERATION SCHEDULE *
============================
The FO-20 operation schedule is follows. Analog transponder and digital
transponder will be ON for a week respectively as they were since last
December.

Analog mode:
26-Jan-94 08:20 UTC -to- 02-Feb-94 06:50 UTC
09-Feb-94 07:15 UTC -to- 16-Feb-94 07:40 UTC
23-Feb-94 08:05 UTC -to- 02-Mar-94 06:40 UTC
09-Mar-94 07:05 UTC -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 UTC -to- 30-Mar-94 08:15 UTC

Digital mode:
Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* CORRECTION *
==============
The next STS mission is STS-60, not STS-58 as indicated in last week's issue
of SpaceNews.

* THANKS! *
===========
Thanks to all those who sent messages of appreciation regarding SpaceNews,
especially:

G1LKJ 9V1XA WN3C KC6ROL KI7OM KD9BE Lee Pratt Will Marchant

* FEEDBACK/INPUT WELCOMED *
===========================

Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

121. Two-Line Orbital Element Sets (TLE330)

Newsgroup: rec.radio.amateur.space
Date: 1994-01-21 23:06:28 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.759193588@afit.af.mil>
Source record: 28172
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #329 -
Alouette 1
1 00424U 62049 94014.22383475 .00000043 00000-0 39386-4 0 9599
2 00424 80.4657 76.9158 0023942 149.3196 210.9355 13.67794015561359
ATS 3
1 03029U 67111A 94021.17733706 -.00000106 00000-0 10000-3 0 1578
2 03029 14.5539 8.9865 0012084 263.9964 165.8111 1.00272807 95962
Cosmos 398
1 04966U 71016A 94021.14881606 .00077396 59601-5 18425-3 0 9609
2 04966 51.4655 173.2802 1176898 298.7445 50.0133 13.52629385752577
Starlette
1 07646U 75010A 94019.93357655 -.00000138 00000-0 24777-5 0 7535
2 07646 49.8247 18.3754 0206351 206.5541 152.4663 13.82185188957347
LAGEOS
1 08820U 76039A 94019.18715790 -.00000000 00000-0 10000-3 0 9595
2 08820 109.8434 84.5668 0044226 316.9896 42.7452 6.38664562157638
ETS-2
1 09852U 77014A 94008.62685946 -.00000296 00000-0 10000-3 0 9464
2 09852 11.8687 43.4733 0000720 56.4013 19.6474 1.00022262 9060
GOES 2
1 10061U 77048A 94020.22791726 .00000073 00000-0 10000-3 0 2767
2 10061 10.9227 47.5038 0003095 7.5381 11.9792 1.00290202 5638
IUE
1 10637U 78012A 94019.08081094 -.00000273 00000-0 10000-3 0 9669
2 10637 34.3696 97.3188 1304956 31.4966 326.1994 1.00252655 11229
GPS BI-01
1 10684U 78020A 94020.30746349 -.00000020 00000-0 10000-3 0 2492
2 10684 64.5601 49.9219 0063173 163.5356 196.7308 1.98069486102004
GPS BI-02
1 10893U 78047A 94013.01692972 -.00000038 00000-0 10000-3 0 414
```

```
2 10893 63.6070 289.3866 0211600 13.5865 347.0949 2.01627402114944
GOES 3
1 10953U 78062A 94018.64699150 .00000069 00000-0 10000-3 0 2692
2 10953 9.8459 50.2532 0005022 122.1425 2.9097 1.00268078 10222
SeaSat 1
1 10967U 78064A 94018.89708980 .00000040 00000-0 57752-4 0 2592
2 10967 107.9993 153.2465 0002425 240.5754 119.5141 14.37912995814903
GPS BI-03
1 11054U 78093A 94019.93116994 -.00000043 00000-0 10000-3 0 1559
2 11054 63.2958 286.1343 0043282 175.6141 184.4798 1.93505378111642
Nimbus 7
1 11080U 78098A 94018.12944545 .00000001 00000-0 39510-4 0 3603
2 11080 99.0738 267.1863 0008876 169.6450 190.4889 13.83728369769327
GPS BI-04
1 11141U 78112A 94020.09352913 -.00000023 00000-0 00000+0 0 8561
2 11141 64.5627 50.9211 0048520 24.6931 335.5829 1.92894526 924
GPS BI-05
1 11690U 80011A 94014.33781778 -.00000029 00000-0 10000-3 0 7533
2 11690 64.8971 51.9136 0142213 198.5499 160.9912 2.00554691116454
GPS BI-06
1 11783U 80032A 94007.27451215 -.00000046 00000-0 10000-3 0 9502
2 11783 62.7170 283.5696 0205909 29.7095 331.5105 2.03457907100681
GOES 5
1 12472U 81049A 94007.46860105 .00000099 00000-0 10000-3 0 7459
2 12472 6.4889 59.9836 0004007 2.5132 72.0154 1.00257059 4155
Cosmos 1383
1 13301U 82066A 94018.61111667 .00000069 00000-0 63622-4 0 2587
2 13301 82.9302 59.4335 0027983 144.4331 215.8693 13.68049945576979
LandSat 4
1 13367U 82072A 94018.77555366 .00000112 00000-0 34934-4 0 4351
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1 22057U 92047B 94019.91862088 -.00000047 00000-0 00000+0 0 7992
2 22057 64.9406 354.0599 0009488 312.3120 47.6116 2.13102476 11422
Glonass 58
1 22058U 92047C 94017.98257018 -.00000054 00000-0 00000+0 0 8088
2 22058 64.9362 354.1279 0011660 279.0315 80.8302 2.13103179 11438
TOPEX
1 22076U 92052A 94018.91442910 -.00000038 00000-0 10000-3 0 7182
2 22076 66.0422 241.0558 0007628 264.2449 95.7696 12.80931977 67370
KITSAT-A
1 22077U 92052B 94019.57977942 -.00000037 00000-0 10000-3 0 3538
2 22077 66.0869 231.1289 0008637 324.4927 35.5512 12.86283457 67679
S80/T
1 22078U 92052C 94019.62028489 -.00000037 00000-0 10000-3 0 3538
2 22078 66.0858 230.4840 0010057 329.1484 30.8943 12.86565184 67746
```

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TOPEX R/B
1 22079U 92052D 94018.74344460 -.00000038 00000-0 10000-3 0 3543
2 22079 66.0692 249.2032 0076069 266.4235 92.8073 12.77659143 67253
GPS BIIA-15
1 22108U 92058A 94018.40322873 -.00000018 00000-0 10000-3 0 3581
2 22108 54.4309 263.5977 0105342 133.9931 226.9551 2.00570752 9921
FREJA
1 22161U 92064A 94021.22041319 .00000118 00000-0 10384-3 0 3589
2 22161 63.0069 304.4497 0777575 302.1486 50.6356 13.21717103 62370
LAGEOS II
1 22195U 92070B 94018.77286552 -.00000009 00000-0 10000-3 0 2572
2 22195 52.6354 188.1227 0138412 52.3392 308.9639 6.47294267 29273
GPS BIIA-16
1 22231U 92079A 94014.60222200 .00000037 00000-0 10000-3 0 3616
2 22231 54.7783 205.1755 0253268 315.0542 42.0033 2.00561252 8426
GPS BIIA-17
1 22275U 92089A 94020.72777824 .00000093 00000-0 10000-3 0 3692
2 22275 54.6628 202.4086 0050113 255.0149 104.4432 2.00556918 7954
TDRS 5
1 22314U 93003B 94018.21558313 -.00000274 00000-0 10000-3 0 3618
2 22314 0.7624 73.0436 0002274 272.2211 163.6513 1.00263755 3825
GPS BIIA-18
1 22446U 93007A 94016.81738506 -.00000089 00000-0 10000-3 0 3575
2 22446 54.7421 323.4725 0071114 339.5406 20.1836 2.00548931 6900
Glonass 59
1 22512U 93010A 94020.30999741 -.00000020 00000-0 00000+0 0 5013
2 22512 64.8872 113.9273 0009242 197.5293 162.4646 2.13101917 6963
Glonass 60
1 22513U 93010B 94019.31204414 -.00000016 00000-0 00000+0 0 5159
2 22513 64.8736 113.9740 0007426 194.7055 165.2941 2.13102610 7139
Glonass 61
1 22514U 93010C 94018.13974953 -.00000008 00000-0 00000+0 0 4982
2 22514 64.8870 114.0014 0013845 191.9703 168.0151 2.13101596 7110
ASTRO-D
1 22521U 93011A 94020.88210814 .00001451 00000-0 12188-3 0 2596
2 22521 31.1032 280.9718 0076454 93.4518 267.4869 14.92902398 50065
UFO F1
1 22563U 93015A 94012.47448469 -.00000238 00000-0 10000-3 0 2539
2 22563 26.9242 302.0507 0008539 313.8514 146.6990 0.99250866 7290
GPS BIIA-19
1 22581U 93017A 94019.94749992 -.00000057 00000-0 10000-3 0 2691
2 22581 55.0448 23.5759 0043553 31.0731 329.2123 2.00573022 5987
ProgressM17
1 22588U 93019A 94020.85027225 .00168018 22887-4 25603-3 0 4622
2 22588 51.6166 189.8452 0069281 164.8044 195.5073 15.99310005 46263
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000+0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
GPS BIIA-20
1 22657U 93032A 94021.07500191 -.00000049 00000-0 00000+0 0 2635
```

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2 22657 55.0818 23.3428 0054130 263.4961 95.8886 2.00565090 1335
GPS BIIA-21
1 22700U 93042A 94019.04940055 -.00000014 00000-0 10000-3 0 2655
2 22700 54.6142 264.2725 0025556 316.2467 43.6079 2.00573506 4095
Soyuz TM-17
1 22704U 93043A 94013.93725956 .00005812 00000-0 77524-4 0 3211
2 22704 51.6172 240.6118 0004869 198.9403 161.2036 15.59719722 30888
NOAA 13
1 22739U 93050A 94018.93703994 .00000054 00000-0 54691-4 0 2841
2 22739 98.9312 324.0403 0009874 177.1315 182.9911 14.10874957 22917
GPS BIIA-22
1 22779U 93054A 94016.14735071 -.00000089 00000-0 10000-3 0 2777
2 22779 54.8606 323.4541 0036856 113.2298 246.0756 2.00565917 2797
Meteor 2-21
1 22782U 93055A 94018.89845223 .00000039 00000-0 21950-4 0 2565
2 22782 82.5520 324.7383 0021299 286.9901 72.8924 13.82996980 19459
UFO F2
1 22787U 93056A 94013.70207045 -.00000069 00000-0 10000-3 0 2545
2 22787 4.9795 323.0336 0003604 305.1016 169.4073 1.00275862 248
SPOT 3
1 22823U 93061A 94021.17059704 .00000169 00000-0 10000-3 0 2651
2 22823 98.7314 97.7850 0001256 66.0288 294.1019 14.20029926 16627
STELLA
1 22824U 93061B 94018.71111386 -.00000003 00000-0 16759-4 0 2558
2 22824 98.6730 95.8903 0005660 292.3743 67.6836 14.27094688 16354
KO-25
1 22825U 93061C 94019.72247017 .00000027 00000-0 29077-4 0 2554
2 22825 98.6691 96.9318 0008187 288.0100 72.0189 14.27602195 16505
POSAT-1
1 22826U 93061D 94019.71418851 .00000039 00000-0 33650-4 0 2566
2 22826 98.6699 96.9405 0008800 287.8045 72.2176 14.27704587 16504
HEATHSAT
1 22827U 93061E 94020.19652237 .00000057 00000-0 41123-4 0 3182
2 22827 98.6651 97.3998 0008478 272.5750 87.4461 14.27808386 16574
ITAMSAT
1 22828U 93061F 94019.56582932 .00000027 00000-0 28974-4 0 2552
2 22828 98.6660 96.7761 0008832 278.5909 81.4271 14.27807823 16480
EYESAT-1
1 22829U 93061G 94019.83076109 .00000043 00000-0 35094-4 0 2488
2 22829 98.6637 97.0590 0009464 272.4108 87.5991 14.27998015 16520
1993 061H
1 22830U 93061H 94018.70725859 .00000024 00000-0 27074-4 0 2576
2 22830 98.5682 94.7740 0010836 255.1004 104.8973 14.28027856 16362
GPS BIIA-23
1 22877U 93068A 94019.19120288 -.00000048 00000-0 10000-3 0 703
2 22877 55.1072 84.4390 0030949 284.5440 75.1712 2.00555889 1745
Meteosat 6
1 22912U 93073B 94019.56124181 -.00000076 00000-0 10000-3 0 606
2 22912 1.2500 267.9781 0002828 332.4304 70.1519 1.00270490 641
HST Array
```

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1 22920U 90037C 94018.60153014 .00008285 00000-0 73948-3 0 624
2 22920 28.4701 115.2647 0004964 120.8776 239.2302 14.94289638 7078
Molniya1-87
1 22949U 93079A 94018.31978200 -.00000888 00000-0 69428-3 0 477
2 22949 62.8513 346.3688 7397335 280.5149 11.0116 2.04438150 554
1993079D
1 22952U 93079D 94020.06986038 .00000364 00000-0 88518-4 0 306
2 22952 62.7945 345.9561 7386255 280.4488 11.0603 2.05973365 593
1993062E
1 22955U 93062E 94015.06983799 .00010626 00000-0 18413-2 0 77
2 22955 47.0744 245.5249 7296826 28.0200 357.0199 2.27262875 1853
1993062F
1 22956U 93062F 94017.61916565 .00086252 -26382-6 23616-2 0 154
2 22956 47.0130 244.1478 7289614 29.3681 356.8180 2.31352865 1251
Soyuz TM-18
1 22957U 94001A 94019.89604207 -.00022085 00000-0 -26584-3 0 255
2 22957 51.6158 210.6456 0003867 214.4022 145.5072 15.59647778 1831
1994001B
1 22958U 94001B 94011.16498878 .14488590 12745-4 11292-3 0 201
2 22958 51.6122 253.6269 0000394 242.0363 118.1984 16.52443821 451
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

122. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-22 02:12:59 UTC
From: dts@world.std.com
Message-ID: <CK0E5n.LG9@world.std.com>
Source record: 28167
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan17.145311.25166@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>>I (devlin@lf.hp.com) wrote:
>>
>>Please forgive me for I'm about to do the unthinkable. I'm actually
>>going to quote from the book I referenced above. Remember, this man was
>>a Nobel prize-winning physisist who had inside access to the shuttle
>>development personnel during the investigation of the Challenger.
>
>Feynman was a visionary physicist, a great teacher, and a wonderful
>populariser of science, but he was not a computer systems reliability
>*engineer*. He's commenting outside his field here.
>
>>From page 192 of _What_Do_You_Care_What_Other_People_Think_:
>>
>> "Although there's a lot of good software being written at Johnson, the
>> computers on the shuttle are so obsolete that the manufacturers don't
>> make them anymore. The memories in them are the old kind, made with
>> little ferrite cores that have wires going through them. In the
>> meantime we've developed much better hardware: the memory chips of
>> today are much, much smaller; they have much greater capacity; and
>> they're much more reliable. They have internal error-correcting codes
>> that automatically keep the memory good. With today's computers we
>> can design separate program modules so that changing the payload
>> doesn't require so much program rewriting.
>>
>> Because of the huge investment in the flight simulators and all the
>> other hardware, to start all over again and replace the millions of
>> lines of code that they've already built would be very costly."
>>
>>(There's a lot of associated information that discusses how each mission
>>is flown on simulators using the same software before the actual mission.)
>>
>>So all of you core memory apologists can give it rest now. I think it's
>>pretty clear from the above excerpt that the core memory is a vestige of
>>the shuttle's past. It is not required for its alleged reliability or
>>immunity to extraterrestrial electromagnetic events.
>
>It's unsurprising that Shuttle computers aren't made anymore. They were
>special built for the Shuttle, and we aren't building any more Shuttles.
>However, the Shuttle computers have recently been upgraded, and three
>of the four now do use some ECC memory for non-critical data storage.

>ECC is *not* proof against SEUs, but it's much better than unprotected
>memory. ECC can protect against single bit errors, and most double bit
>errors, but a triple hit and it's game over. Core doesn't care.

There were plans at one point to use a 386-based system in the shuttle's
main computer systems, though the last time I heard anything about them
was before Challenger. (The garbage scow - earth controlled garbage
collector droid also has not been mentioned in years).

>
>>There's a lot of great information about the shuttle program in the
>>book. I believe someone mentioned in an earlier posting that the
>>shuttle doesn't need much memory and that's why core is acceptable.
>>Here's why that's not correct:
>>
>>From page 190:
>>
>> "The shuttle's computers don't have enough memory to hold all the
>> programs for the whole flight. After the shuttle gets into orbit, the
>> astronauts take out some tapes and load in the program for the next
>> phase of the flight -- there are a many as six in all. Near the end
>> of the flight, the astronauts load in the program for coming down.

From what I recall the tapes are kind of strange too. 9 track tape which
is read as 5 separate data streams when moving one way, 4 when moving
the other. Each track independent. Something about minimizing the amount of
movement needed to load a program, from what I recall...

>>
>> The shuttle has four computers on board, all running the same
>> programs. All four are normally in agreement. If one computer is out
>> of agreement, the flight can still continue. If only two computers
>> agree, the flight has to be curtailed and the shuttle brought back
>> immediately."
>>
>>If memory requirements really were minimal, it wouldn't be necessary to
>>be carrying all those tapes along.
>
>There's no good reason to have the entire software load for the entire
>flight profile in the computer at once. Loading in the proper programs
>at the proper time from tape is perfectly acceptable. Does your computer
>keep every bit of software you use in memory at all times? Of course not.
>That's why we have hard disks. However, hard disks aren't that sturdy
>when subjected to launch vibration and G forces, so Shuttle uses tape
>instead for program storage.

The latest hard disks are quite capable of handling the G forces present
in most any craft. The ratings on some of the new 3.5" and smaller drives
are something like 100Gs when off, and 20 or more Gs while running. Laptops
have had a wonderful influence on hard disk design.

>
>Note, Apollo used the HP-35 calculator as backup for it's computers,
>so the necessary data loads aren't that large. Shuttle carries the
>HP-41CV as an ultimate backup to it's computers. If all four main
>computers fail, the pilot can manually calculate trajectories with
>it's aid. Naturally it isn't as robust as the normal computers, but
>it's better than nothing, and takes up little mass or volume.

Are they still using the HP41s? I'd figured they'd have moved the programs
over to the grid laptops by now.

>
>Note also that program bloat can be traced almost completely to having
>excess RAM available. Programs naturally expand to fill the space available,
>witness Wordstar. It was a great fast program on a 48 kb Z-80 system, but

common misconception. Wordstar NEVER fit in 48K. Sure it would run in a
machine that had 48K, but every time you hit ^Y to delete a line, it
had to swap in an overlay from disk to do the function, then swap back
to the main code. When more memory is available, it is possible to
improve performance.

>now it's a multi-megabyte dog on a Windows PC with 8+ megs of RAM. And
>that's 166 times more RAM to develop a bit error that can crash the system.
>To a large degree, reliability is a function of parts count. The fewer
>parts, the less to go wrong.
>

Actually in software the less is better philosopy does not always hold. To
get program size smaller, one could always skip the bounds checking and input
parameter checking. Fewer parts, but less reliability...

>Gary
>--
>Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary

--

Daniel Senie Internet: dts@world.std.com
Daniel Senie Consulting n1jeb@world.std.com
508-365-5352 Compuserve: 74176,1347

123. Daily IPS Report - 22 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-22 02:40:40 UTC
From: dave@eram.esi.com.au
Message-ID: <5134@eram.esi.com.au>
Source record: 28181
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 21 January 1994
Summary for 21 January and Forecast up to 24 January
No warning is current.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 111/062

1B. SOLAR FORECAST
22 January 23 January 24 January
Activity Low to moderate Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet to unsettled

Estimated Indices : A K Observed A Index 20 January
Learmonth 09 2222 2332
Fredericksburg 05 13
Planetary 06 12

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
22 Jan 20 Unsettled to active.
23 Jan 16 Unsettled.
24 Jan 06 Quiet.

2C. MAGNETIC COMMENT
Active periods expected 22-23 due to small coronal hole. Another coronal hole has returned to the east, and will probably increase geomagnetic activity during 27-29 Jan. (Not February as was stated yesterday).

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND

DATE LOW MIDDLE HIGH
21 Jan normal normal normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
22 Jan normal fair poor
23 Jan normal fair poor
24 Jan normal normal normal
3C. GLOBAL HF PROPAGATION COMMENT
Degraded conditions expected due to small coronal hole.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values

T index: 38

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
22 Jan 30 Near predicted monthly values.
23 Jan 20 About 10% below predicted monthly values.
24 Jan 30 Near predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

124. HELP:Trouble with TRACKSAT 3.00 !

Newsgroup: rec.radio.amateur.space
Date: 1994-01-22 13:01:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.257.1818.0NC5C4FA@compart.fi>
Source record: 28177

```
-> menu screen. I can't choose any of the menu alternatives. When I
-> start TRAKSAT with the /x switch the program starts up but when I
-> tree to read the TLE.TXT file it crashes and displays;
->
-> RUNTIME ERROR 6806 Can not read file !
```

I have similar problems. Check the beginning of the orbital element file there may be text or something which causes the problem.

Leo Wikholm

125. Space Shuttle computers (Was: Vacuum tubes in spacecraft?)

Newsgroup: rec.radio.amateur.space
Date: 1994-01-22 20:37:38 UTC
From: bwalzer@lark.muug.mb.ca
Message-ID: <1994Jan22.203738.19126@lark.muug.mb.ca>
Source record: 28178
Cross-posted to: sci.electronics,rec.radio.amateur.space

dts@world.std.com (Daniel T Senie) writes:

>In article <1994Jan17.145311.25166@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>>In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>>>I (devlin@lf.hp.com) wrote:
>>

[discussion of space shuttle computers and an analogy to PC software deleted]

>Actually in software the less is better philosopy does not always hold. To
>get program size smaller, one could always skip the bounds checking and input
>parameter checking. Fewer parts, but less reliability...

Bounds checking and and parameter checking make reliable software? I think that's a bit general in the case of shuttle computers and word processors. I got really happy when Display Write 4 used to lock up on an error whenever I hit the left margin with the cursor. "Attempt to backspace past left margin" it said helpfully.

Imagine the delight and relief of the shuttle pilot if the computer said something like "Subscript out of range. Program halted." when s/he was on final approach.

--
Bruce Walzer |Voice: (204) 783-4983
Winnipeg MB |Internet: bwalzer@lark.muug.mb.ca
Canada |Amateur Radio: VE4XOR

126. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-23 06:03:33 UTC
From: lyndon@unbc.edu
Message-ID: <2ht3vl$abb@unbc.edu>
Source record: 28179
Cross-posted to: sci.electronics,rec.radio.amateur.space

dts@world.std.com (Daniel T Senie) writes:

>The latest hard disks are quite capable of handling the G forces present
>in most any craft. The ratings on some of the new 3.5" and smaller drives
>are something like 100Gs when off, and 20 or more Gs while running. Laptops
>have had a wonderful influence on hard disk design.

Make sure you understand the fine print. Many of these drives have their
published specifications based upon a SINGLE foo-G drop. This does not
equate to the sort of cruft a drive could expect to go through during a
single shuttle launch, let alone many.

For comparison, look at the building code specifications for the Los
Angeles ares. There are buildings and highway superstructures rated to
withstand a .4G accelleration during a 'quake. What isn't generally specified
is the *duration* of that .4G accelleration. .4G for 5 seconds can be *very*
differrent from .4G for 30 seconds. A shuttle launch is very comparable to
the recent Los Angeles 'quake if you're talking disk drives and buildings.

--lyndon

127. Eutelsat information?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-23 17:43:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.260.1818.0NC5CA72@compart.fi>
Source record: 28180

Does anyone know from where I can obtain information about
Eutelsat? I want general information like when was this
organization founded and how many satellites they have in
orbit.

Leo Wikholm
e-mail: leo.wikholm@compart.fi

128. ANS-022 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-01-23 22:55:06 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-022.01.1994@ampr.org>
Source record: 28183
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT
STS-60 AST

HR AMSAT NEWS SERVICE BULLETIN 022.01 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 22, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-022.01

STS-60 AST

Astronauts Charles F. Bolden, Jr. of Columbia, South Carolina and Ronald M. Sega of Seabrook, Texas, have been issued amateur radio call signs in preparation for their joint U.S.-Russia science mission. The Spacehab science objectives are primarily micro-gravity oriented with emphasis on materials and life science. Bolden (KE4IQB) is commander of the space shuttle Discovery (OV-103) due for lift off on February 3, 1994, at 12:10 UTC from Cape Kennedy. Sega (now KC5ETH) is the second of four Mission Specialists. They plan to contact several schools as part of the SAREX program - including one in Russia. The flight of STS-60 represents an historic first, the first of several joint U.S.-Russian Space Shuttle flights planned in preparation for the development of the international Space Station. Veteran cosmonaut Sergei Krikalev (U5MIR) was chosen to be the first Russian to fly on the U.S. Space Shuttle. During the 8 day flight, Cosmonaut Krikalev will support the science operations on the Space Shuttle as Mission Specialist 4. Last year, Sergei attended the Dallas Ham-Com convention and said he would try to qualify for a U.S. license - but his training duties have prevented him from doing so. Since no reciprocal operating privileges exist between Russia and the United States, Sergei will operate amateur radio under Bolden's control operator authority. The possibility also exists for the first U.S. Space Shuttle to Mir Space Station (Russian astronaut-to-Russian cosmonaut) amateur radio contact! Three new Russian amateurs were launched on January 8, 1994 aboard a Soyuz rocket and docked at the MIR space station on January 10th. The new crew includes Viktor Afanasiev (commander) U9MIR, Yuri Usachev (flight engineer) R3MIR and Valerij Polyakov (doctor) U3MIR. They are using the call sign R0MIR on packet.

[The AMSAT News Service would like to thank W5YI for this bulletin item.]

/EX
SB SAT
MICROSATS TURN 4 YEARS OLD!

HR AMSAT NEWS SERVICE BULLETIN 022.02 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 22, 1994

TO ALL RADIO AMATEURS BT
BID: $ANS-022.02

HAPPY 4TH BIRTHDAY To DOVE, PACSAT, WEBERSAT, And LUSAT!

Four years ago, four small cube-shaped satellites were launched from the Kourou, French Guyana spaceport aboard an Ariane rocket at 01:35 UTC, 21-JAN-90. They started a new era in radio amateur satellite comunications.

/EX
SB SAT
STS-60 SAREX TWO WEEKS AWAY!

HR AMSAT NEWS SERVICE BULLETIN 022.03 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 22, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-022.03

STS-60 SAREX Mission Less Than Two Weeks Away

STS-60 is currently scheduled for launch on February 3, 1994 at 12:10 UTC. The flight of STS-60 represents an historic first -- the first joint U.S.-Russian Space Shuttle flight. This will be the first of several joint missions planned in preparation for the development of the international Space Station. Cosmonaut Sergei Krikalev, U5MIR, was chosen to be the first Russian to fly on the U.S. Space Shuttle. SAREX information for STS-60 including frequencies, callsigns and Keplerian elements, follows:

STS-60 Shuttle Amateur Radio Experiment (SAREX) Information Sheet

Mission: STS-60 Space Shuttle Discovery Wake Shield Facility & Spacehab-2 Mission

Launch: February 3, 1994, 12:10 UTC

Orbit: 57 degree inclination

Mission Length: 8 days (Nominal)

Amateur Radio
Operators: Charlie Bolden, KE4IQB, Ron Sega, KC5ETH,
Sergei Krikalev, U5MIR

Modes: FM Voice
Prime callsign: KE4IQB

Packet Radio
Callsign: W5RRR-1

Frequencies: All operations in split mode. Do not transmit on the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks: 144.91, 144.93, 144.95, 144.97, 144.99 MHz

(Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: The crew will not favor any specific uplink frequency, so your ability to work the crew will be the "luck of the draw."

Packet Freqs: Downlink: 145.55 MHz
Uplink:144.49 MHz

Info: Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland, SAREX Bulletins and Shuttle Retransmissions
3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz and 147.45 MHz (FM)

Johnson Space Center ARC, W5RRR, Houston, Texas SAREX Bulletins
7225 KHz, 14,280 KHz, 21,395 KHz, 28,650 KHz, (SSB) and 146.64 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT SAREX News Bulletins 3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz and 147.555 MHz (FM)

Also, bulletins available on internet, via AMSAT ANS, Compuserve, and your local PBSS.

School Group Participation: 5 school groups will participate in SAREX with pre-scheduled direct and telebridge contacts. These include 4 in the U.S. and one in Russia.

Prelaunch Keplerian Elements:

The following Keplerian Elements are provided by Gil Carman, WA5NOM at the Johnson Space Center ARC:

Satellite: STS-60
Catalog number: 00060
Epoch time: 94034.56756353 (03 FEB 94 13:37:17.49 UTC)
Element set: 004
Inclination: 57.0033 deg
RA of node: 215.8607 deg Space Shuttle Flight STS-60
Eccentricity: .0010675 Prelaunch Element set JSC-004
Arg of perigee: 264.1500 deg Launch: 03 FEB 94 12:10 UTC
Mean anomaly: 95.8328 deg
Mean motion: 15.72291901 rev/day Gil Carman, WA5NOM
Decay rate: 3.3600e-04 rev/day*2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 254

/EX
SB SAT
AO-13 OPERATIONS NET

HR AMSAT NEWS SERVICE BULLETIN 022.05 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 22, 1994

TO ALL RADIO AMATEURS BT
BID: $ANS-022.05

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

06-Feb-94 0530 B 057 W5IU WA5ZIB
12-Feb-94 2200 B 063 W9ODI VE2LVC
20-Feb-94 0200 B 070 WA5ZIB W5IU
28-Feb-94 0430 B 068 WB6LLO W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

/EX
SB SAT
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 022.06 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 22, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-022.06

Weekly OSCAR Status Reports: 21-JAN-94

AO-13: Current Transponder Operating Schedule:
L QST
Mode-B : MA 0 to MA 180 | OFF
Mode-B : MA 180 to MA 220 |
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 240/-5
Mode-B : MA 250 to MA 256 | OFF
Omnis : MA 250 to MA 150 | Move to attitude 180/0, 31-Jan-94

L QST
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04

Poor Sun angle and battery testing need maximum OFF time.
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current FO-20 operating schedule:
From January '94 thru March '94, the analog mode and the
digital mode will be on alternately for a week at a time.
ANALOG MODE:
26-JAN-94 8:20 -TO- 02-FEB-94 6:50 UTC
09-FEB-94 7:15 -TO- 16-FEB-94 7:40 UTC
23-FEB-94 8:05 -TO- 02-MAR-94 6:40 UTC
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Up and running. Busy as usual. The most recent image files have
been blank. [WH6I]

PoSAT: G3AAJ reports than an agreement has been signed regarding the
PoSAT schedule and that amateur access to PoSAT will commence on
the 28th or 29th of January '94. [G3IOR]

KO-25: G3RWL had a personal communication from the ground controllers
stating that KO-25 will open up for amateur radio communications
in early Febuary '94. [G3IOR]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current
set of orbital elements are not generating the correct AOS/LOS times at
your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you
provide will be of value to all OSCAR enthusiasts.

/EX

129. Daily IPS Report - 23 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-23 23:31:14 UTC
From: dave@eram.esi.com.au
Message-ID: <5139@eram.esi.com.au>
Source record: 28186
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 22 January 1994
Summary for 22 January and Forecast up to 25 January
No warning is current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 113/064

1B. SOLAR FORECAST
23 January 24 January 25 January
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet to unsettled

Estimated Indices : A K Observed A Index 21 January
Learmonth 04 3211 0012
Fredericksburg 05 07
Planetary 07 07

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
23 Jan 15 Quiet to unsettled.
24 Jan 06 Quiet.
25 Jan 06 Quiet.

2C. MAGNETIC COMMENT
Active periods for 22nd did not eventuate. Active periods expected
during interval 27-29 Jan due to coronal hole.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
22 Jan normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
23 Jan normal fair fair
24 Jan normal normal normal
25 Jan normal normal normal
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were slightly above predicted monthly values

T index: 53

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
23 Jan 60 About 15% above predicted monthly values.
24 Jan 50 Near predicted monthly values.
25 Jan 60 About 15% above predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Slight degradations possible on the 23/24th.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

130. Daily IPS Report - 24 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-23 23:32:02 UTC
From: dave@eram.esi.com.au
Message-ID: <5140@eram.esi.com.au>
Source record: 28187
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 23 January 1994
Summary for 23 January and Forecast up to 26 January
No warning is current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 118/070

1B. SOLAR FORECAST
24 January 25 January 26 January
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet to unsettled

Estimated Indices : A K Observed A Index 22 January
Learmonth 05 2221 1211
Fredericksburg 05 09
Planetary 05 07

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
24 Jan 08 Quiet to unsettled.
25 Jan 08 Quiet to unsettled.
26 Jan 08 Quiet to unsettled.

2C. MAGNETIC COMMENT
Active periods expected during interval 27-29 Jan due to coronal
hole.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
23 Jan normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
24 Jan normal normal fair
25 Jan normal normal fair
26 Jan normal normal fair
3C. GLOBAL HF PROPAGATION COMMENT
HF Conditons should remain good until Jan 27 when degraded comms
are expected for mid and high lats.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were about 15% above predicted monthly values

T index: 75

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
24 Jan 60 About 15% above predicted monthly values.
25 Jan 60 About 15% above predicted monthly values.
26 Jan 60 About 15% above predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded HF comms expected during Jan 27-29.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

131. Re: Space Shuttle computers (Was: Vacuum tubes in spacecraft?)

Newsgroup: rec.radio.amateur.space
Date: 1994-01-24 04:21:12 UTC
From: dts@world.std.com
Message-ID: <CK49FF.35L@world.std.com>
Source record: 28182
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan22.203738.19126@lark.muug.mb.ca> bwalzer@lark.muug.mb.ca (Bruce Walzer) writes:
>dts@world.std.com (Daniel T Senie) writes:
>
>>In article <1994Jan17.145311.25166@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>>>In article <2hd6ji$q5e@hpavla.lf.hp.com> devlin@lf.hp.com (Lee Devlin) writes:
>>>>I (devlin@lf.hp.com) wrote:
>>>
>
>[discussion of space shuttle computers and an analogy to PC software
>deleted]
>
>>Actually in software the less is better philosopy does not always hold. To
>>get program size smaller, one could always skip the bounds checking and input
>>parameter checking. Fewer parts, but less reliability...
>
>Bounds checking and and parameter checking make reliable software? I think
>that's a bit general in the case of shuttle computers and word processors. I
>got really happy when Display Write 4 used to lock up on an error whenever I
>hit the left margin with the cursor. "Attempt to backspace past left
>margin" it said helpfully.

It's too bad that the programmer of Display Write 4 failed to add the code that DID SOMETHING when a boundary condition was hit. I maintain that I'd still rather have the checks there are DO SOMETHING about the case.

It is ENTIRELY possible for software to detect faults and respond to them. Rather than either hitting a boundary and giving up, or not bothering to check a boundary and corrupting data it makes sense to detect, report and correct for software faults where possible.

>
>Imagine the delight and relief of the shuttle pilot if the computer said
>something like "Subscript out of range. Program halted." when s/he was on
>final approach.

Imagine when the computer fails to detect a bounds condition, corrupts memory and fails to continue processing joystick commands to the flaps. If the computer detects its bounds problem, it can at least take itself out of the loop and nominate a backup system when backup systems are available (as is the case on the shuttle). These principles apply to real time, mission critical, fault tolerant and Online Transaction Processing systems. In all cases the customer has paid for a system to solve a problem under all

conditions. Stopping and giving a panic message, or failing to detect a fault are equally unacceptable solutions.

>--
>Bruce Walzer |Voice: (204) 783-4983
>Winnipeg MB |Internet: bwalzer@lark.muug.mb.ca
>Canada |Amateur Radio: VE4XOR

--

Daniel Senie Internet: dts@world.std.com
Daniel Senie Consulting n1jeb@world.std.com
508-365-5352 Compuserve: 74176,1347

132. Arsene

Newsgroup: rec.radio.amateur.space
Date: 1994-01-24 11:45:07 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.72.0@UPEI.CA>
Source record: 28184

Hi - Its been a long time since I've seen anything about Arsene and was wondering if it has any funtions going at all at this time.

Tnx - Dave, VY2DCS
Internet : Seeler@upei.ca

133. Low Pass filter vs Band Pass - Mode JD

Newsgroup: rec.radio.amateur.space
Date: 1994-01-24 11:53:17 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.73.759412397@UPEI.CA>
Source record: 28185

I have some desensing of my 440 rig on receive when the 2 meter rig fires up on Mode JD. This is not a MAJOR problem but I would like to resolve it. I suspect that it involves the 3rd harmonic of the 2 meter Transmitter.

The books suggest using a low pass or band pass filter - but they differ as to which would be best (opinion or operation differences?). I use the all IC275 for Dx and local operations as well and suspect that the low pass filter would be a good start. The filter in the VHF/UHF Dx book appears to fit my needs - 35? db attenuation of the 2nd harmonic and 60 db attenuation of the 3rd - with minimal (?) insertion loss.

My questio is this - is the low pass filter the best way to solve this particular issue - and if so - does anyone have any suggestions as to any particular filter design / schematics - and comments as to how they/it works?

Thanks for considering this post.

Dave, VY2DCS
Internet: Seeler@upei.ca

134. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-24 16:24:44 UTC
From: peterson@physc1.byu.edu
Message-ID: <1994Jan24.092444.1288@physc1.byu.edu>
Source record: 28188
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <CK0E5n.LG9@world.std.com>, dts@world.std.com (Daniel T Senie) writes:
> In article <1994Jan17.145311.25166@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>>Note also that program bloat can be traced almost completely to having
>>excess RAM available. Programs naturally expand to fill the space available,
>>witness Wordstar. It was a great fast program on a 48 kb Z-80 system, but
>
> common misconception. Wordstar NEVER fit in 48K. Sure it would run in a
> machine that had 48K, but every time you hit ^Y to delete a line, it
> had to swap in an overlay from disk to do the function, then swap back
> to the main code. When more memory is available, it is possible to
> improve performance.
>
>>now it's a multi-megabyte dog on a Windows PC with 8+ megs of RAM. And
>>that's 166 times more RAM to develop a bit error that can crash the system.
>>To a large degree, reliability is a function of parts count. The fewer
>>parts, the less to go wrong.
>>
>
> Actually in software the less is better philosopy does not always hold. To
> get program size smaller, one could always skip the bounds checking and input
> parameter checking. Fewer parts, but less reliability...
>
>>Gary
>>--
>>Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
>
> --
> --
> Daniel Senie Internet: dts@world.std.com
> Daniel Senie Consulting n1jeb@world.std.com
> 508-365-5352 Compuserve: 74176,1347

Actually there are two other driving forces in the software bloat that are only allowed to operate because of the cheap RAM: 1) The demand for software that requires no thought or training. Some of this is good and some of it is useless "creeping featurism" (I have yet to understand why a top quality word processing package would require you to remove your hands from the keyboard to perform basic formatting functions). And 2) the trend toward using high-level languages for all software development. Most of those "lean and mean" packages of the past were written in optimized assembly code because RAM was tight. Now they don't have to put any effort into optimizing the code and are able to write using high-level languages and compilers that generate absolutely

horrendous code (from an efficiency standpoint). Yes, that allows them to meet the demands of (1) above more quickly but at a tremondous cost in storage space (just for grins look at the bloat in the distribution disks for ANY package over the last few years - things that used to be delivered on 2 360K floppies now require 4 to 6 1.44M floppies and add data compression to boot). Whether this whole trend is good or bad is a totally religious argument (hardware is cheap and features are nice versus why do I need so much hardware just to run a simple application).

However, any way you look at it my hat goes off to the programmers who are able to fit the entire control program for the Shuttle into the memory on those computers. I can guarantee they are not using the bloated high-level languages that you normally see in the PC world to do that.

Bryan Peterson, ki7td
peterson@physc1.byu.edu

135. question about a calculation of satellite orbit

Newsgroup: rec.radio.amateur.space
Date: 1994-01-24 23:19:49 UTC
From: benjie@hip-hop.sbay.org
Message-ID: <2i1l2l$6eo@hip-hop.hh.sbay.org>
Source record: 28196
Cross-posted to: sci.space,rec.radio.amateur.space

The question is at end. Here is the description of the problem I am having.

I was trying to calculate the longitude for oscar 21. I got the following formulas from a friend of mine.

Lon[W] = {[(JxR-D)x24+6.6285792]*15}-RAx

Where J is the julian day (in days) with out year, that is, something like 24.8777day. R is the earth rotation rate 1.002737851 rev/day. D is the integral value of JxR. (JxR-D)x24+6.6285792 is the Greenwich Sidereal Time (GST) in hours, thus [(JxR-D)x24+6.6285792]*15 is GST in degrees. RAx is the RA at current time.

RAx = RA0 + [Jx-J0]x(d(RA)/dt)

RA0 and J0 are the RA and Julian day at epoch. d(RA)/dt is the rate of change of RA.

Here are my calculations:

At PST time 12:00, or UTC time 20:00 today (UTC date Jan 24),
the Julian day (UTC) is

25.83333

therefore I calculated (JxR-D)*24+6.6285792, GST in hours, to be

28.32605

subtracting since it is greater than 24, I subtracted 24 from it,
and got

4.32605

multiply by 15 I got

64.89070

which is the GST in degrees.

Then I calculated the RAx. I used the data (got from the net) with epoch 94019.17209926. RA at that point is 252.9794.

In order to calculate d(RA)/dt, I had to find the data with epoch 94012.62069919. RA at that point is 257.8282.

Thus the d(RA)/dt is approximately

(252.9794-257.8282)/(19.17209926-12.62069919) = -0.74012

Therefore the RAx at 25.83333 would be

252.9794 + (25.83333-19.17209926)x(-0.74012) = 248.049312108.

Now the lon[w] should be the difference between GST in degrees and RAx.

GST in degrees - RAx = 64.89070 - 248.049312108 = -183.15861 degree W.

So here is the problem, my tracking software, PCTRACK, predicted a lon of 145.1 east.

I don't see a correlation between the two numbers. Did I use the wrong formula? Are the formulas the same for all sat? Is Oscar 21 somewhat different?

All information, answers are welcome.

Thanks

Benjie

136. Daily IPS Report - 25 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-24 23:29:06 UTC
From: dave@eram.esi.com.au
Message-ID: <5143@eram.esi.com.au>
Source record: 28190
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 24 January 1994
Summary for 24 January and Forecast up to 27 January
IPS Warning 02 was issued at 24/2200UT January and is current
for period January 27 - 29.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 129/082

1B. SOLAR FORECAST
25 January 26 January 27 January
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 130/084

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet

Estimated Indices : A K Observed A Index 23 January
Learmonth 02 2111 0001
Fredericksburg 02 07
Planetary 04 05

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
25 Jan 08 Quiet to unsettled.
26 Jan 08 Quiet to unsettled.
27 Jan 20 Unsettled to active.

2C. MAGNETIC COMMENT
Active periods expected during interval 27-29 Jan due to coronal
hole.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

24 Jan normal normal normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
25 Jan normal normal fair
26 Jan normal normal fair
27 Jan normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Degraded comms expected at mid/high lats during interval
27-29 January.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were about 15% above predicted monthly values

T index: 73

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
25 Jan 75 About 15% above predicted monthly values.
26 Jan 75 About 15% above predicted monthly values.
27 Jan 75 About 15% above predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded HF comms expected during Jan 27-29.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

137. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-25 05:33:08 UTC
From: johnh@macadam.mpce.mq.edu.au
Message-ID: <2i2auk$s1p@sunb.ocs.mq.edu.au>
Source record: 28193
Cross-posted to: sci.electronics,rec.radio.amateur.space

In article <1994Jan24.092444.1288@physc1.byu.edu>, peterson@physc1.byu.edu writes:

|> However, any way you look at it my hat goes off to the programmers who are able
|> to fit the entire control program for the Shuttle into the memory on those
|> computers. I can guarantee they are not using the bloated high-level languages
|> that you normally see in the PC world to do that.
|>
|> Bryan Peterson, ki7td
|> peterson@physc1.byu.edu

As far as I know (from a job application with the European Space Agency),
all the code for the Ariane system is written in Modula-2 (which, by any
definition, is a high-level language).

Modern optimizing compilers can do a _very_ good job. In many instances,
it'd take a top-flight programmer to do better at the assembler level
(as well as an awful lot more time).

JohnH

138. Status of polar-orbiting weather satellites

Newsgroup: rec.radio.amateur.space
Date: 1994-01-25 15:46:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.281.1818.0NC5CD03@compart.fi>
Source record: 28189

```
STATUS OF POLAR-ORBITING WEATHER SATELLITES
===========================================
No. 2, January 25, 1994
Station: Helsinki, +60.2N +25.1E

-----------------------------------------------------
NOAA 9 137,62 MHz normal
NOAA 10 137,50 MHz VHF conflict with NOAA 12?
NOAA 11 137,62 MHz normal
NOAA 12 137,50 MHz normal
Meteor 3-5 137,30 MHz not actice in North
Meteor 2-21 137,30 MHz not active in North
-----------------------------------------------------

Leo Wikholm
internet: leo.wikholm@compart.fi
fidonet : 2:220/861
```

139. Re: Vacuum tubes in spacecraft?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-25 19:14:57 UTC
From: wb8foz@netcom.com
Message-ID: <wb8fozCK79Gy.EFE@netcom.com>
Source record: 28192
Cross-posted to: sci.electronics,rec.radio.amateur.space

gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>Note, Apollo used the HP-35 calculator as backup for it's computers,
>so the necessary data loads aren't that large.

Err,
The 35 came out in early 72. It took me 6 months to get one.
Thus later Apollo flights may have used them, but not early
ones.

--
A host is a host from coast to coast.................wb8foz@nrk.com
& no one will talk to a host that's close...........(v)301 56 LINUX
Unless the host (that isn't close)....kibo# 665.99.........pob 1433
is busy, hung or dead..............vr...................20915-1433

140. Electronic Journal of the ASA (EJASA) - January 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-01-25 20:10:03 UTC
From: klaes@verga.enet.dec.com
Message-ID: <2i3tvp$e8d@nntpd.lkg.dec.com>
Source record: 28191
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc,rec.arts.sf.science

THE ELECTRONIC JOURNAL OF
THE ASTRONOMICAL SOCIETY OF THE ATLANTIC

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DETECTABILITY OF EXTRATERRESTRIAL TECHNOLOGICAL ACTIVITIES
PART 2

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Ultraviolet Rays

Our planet Earth's atmosphere is opaque to radiation in the ultraviolet waveband due to ozone and molecular absorption. As a result, astronomy in these wavelengths has to be carried out from above the atmosphere, preferably with artificial satellites.

The band divides rather naturally into two regions. The region 300 > lambda > 120 nanometers can be studied using techniques similar to those used in optical astronomy. At shorter wavelengths, however, it is difficult to find materials which reflect radiation at normal incidence. Rather, the incident radiation is simply absorbed by the mirror material with little or no reflection.

Perhaps the main problem for using this waveband as a detector for extraterrestrial intelligence is that at wavelengths shorter than 91.2 nm, the Lyman limit for hydrogen, interstellar gas becomes opaque, probably due to photoelectric absorption by neutral hydrogen in the Lyman continuum. This effect is particularly important for objects localized inside our Milky Way galaxy.

In spite of all these limitations, in 1974, H. Wischnia used the facilities of the Orbiting Astronomical Satellite (OAO, also called COPERNICUS) to search for ultraviolet laser pulses around the nearby stars Epsilon Eridani, Tau Ceti, and Epsilon Indi (Tarter, 1991). The observations were carried out in ultraviolet wavelengths below 0.28 micrometers.

Of particular interest in this waveband are the Lyman series of absorption lines with wavelengths of 1214 A, 1024 A, 971 A, 948 A, and 937 A (where A is Angstrom), corresponding to the various fully excited states of the hydrogen atom. The predominant line is the so-called "Lyman Alpha" of 1024 A. It is quite possible that an extraterrestrial civilization could choose to generate a signal which

may lie close to, or preferably right within, the absorption region. The background radiation of our Sun (and presumably other solar-type stars) is down by a factor of 10exp6 at Lyman Alpha wavelengths when compared with the output of visible light. Such a reduction offers a considerable improvement in the signal-to-noise ratio.

X-Rays

Elliot (1973) pointed out that X-rays are not appropriate as a means of transmitting a continuous stream of information because of their high quantum noise. As a means of sending and receiving the "first beacon signal", however, he considered that X-rays could have certain advantages. Elliot analyzed the X-ray emissions of the terrestrial nuclear explosions carried out in the early 1960s. When a nuclear weapon explodes, about seventy percent of the energy released is in the form of kilovolt X-rays. This X-ray pulse is formed in less than one microsecond. If the explosion occurs above eighty kilometers, the X-rays are not absorbed by the atmosphere and are free to propagate into space.

Other advantages of using the X-ray pulse generated by a high-altitude nuclear explosion are: (a) The pulse is short and will not be broadened or appreciably attenuated by propagation through the interstellar medium; (b) there are not stringent requirements on the receiver, since the pulse covers a broad X-ray spectrum; and (c) the X-ray flux involved is much larger than that of a solar-type star, a natural source of X-rays.

Elliot estimated the distance at which the United States "Starfish" nuclear test could be detected by our present technology of X-ray detectors. Assuming that the energy of the explosion is equivalent to 1.4 megatons and that the X-ray pulse was equally intense in all directions, he found that this explosion should be detected from a distance of d~400 Astronomical Units, about ten times the radius of Pluto's solar orbit.

Supposing that all the terrestrial nuclear powers [3] pooled their nuclear weapons stockpiles to produce a single explosion in space (E~2x10exp4 megatons). Considering that the X-ray pulse could be concentrated into a conical beam of about thirty degrees in angle with no loss of radiation, a typical terrestrial X-ray detector should be able to detect a signal from a distance of ~190 light years.

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3 - In 1989 the United States and the Soviet Union had almost 55,000 nuclear warheads with a combined destructive power of 15,500 megatons (Source: Bulletin of Atomic Scientist, 1990).
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Fabian (1977) suggested that a supercivilization (in the transition from Kardashev's Type I to Type II) could - in the same sense of the proposals by Drake and Shklovskii - drop material onto

a neutron star. This material could be impinged onto the surface at about one-third of the velocity of light. About ten percent of the rest mass energy of the matter will emerge as radiation, predominantly as X-rays if the mass flow rate exceeds ~10exp16 F gm sec-1, F being the fraction of the surface onto which matter falls.

Thus, to produce an X-ray flash as energetic as that suggested by Elliot (1973), ten tons of matter of any composition would have to be dropped onto a neutron star. According to Fabian (1977), such a flash will be broadband and almost omnidirectional, although some beaming may occur if the neutron star possesses a strong magnetic field.

The above arguments show that an object of about one kilometer in size and 10exp16 gm dropped onto a neutron star could produce an X-ray pulse (E~10exp36 ergs) strong enough to be easily detectable throughout the Milky Way galaxy. Harwit and Salpeter (1973) argue that the soft gamma-ray burst observed by Klebesadel et al (1973) may be due to comets falling onto the surface of a neutron star. If an advanced civilization could cause individual objects that might be easily found in the neutron star's neighborhood to fall onto the star in a pre-arranged pattern, this could be detected across the galaxy.

Gamma Rays

Viewing et al (1977) pointed out that an alternative method for SETI could be the detection of alien artifacts. Because most of the different models for interstellar propulsion (Mallove and Matloff, 1989) produce copious quantities of gamma rays, they proposed the search for this kind of radiation from the antimatter annihilation process. Harris (1986) showed that interstellar spacecraft as gamma-ray sources will be most easily recognized by their proper motions. Their velocities, being substantial fractions of the velocity of light, will be at least one hundred times as large as the highest velocities characteristic of normal astronomical objects. No steady gamma-ray source is known with a proper motion as large as one degree per year.

For spacecraft of sufficient size, the poor angular resolution of current gamma-ray telescopes imposes a limit on identification rather than detection. Of the Compton Gamma-Ray Observatory (GRO) instruments, EGRET has an angular resolution of 1.6 degrees at 100 MeV. The best possible resolution of BATSE is 0.5 degrees (Kurfess, 1985, Morris, 1985). In the most favorable circumstances - purely tangential velocity close to c; observations made over the ten-year lifetime of GRO - these resolutions will be able to detect the motion of spacecraft at distances of ~100 parsecs and ~300 parsecs, respectively. The distinctive line emission from these objects is readily detectable if the spacecraft is sufficiently massive. A consumption of ~(1 to 10)Rexp2 tons per second of antimatter is necessary for detection by GRO of a spacecraft at a distance R in pc (Harris, 1991b).

Harris (1991a) reported the negative results of a search for the linear alignments of burst along a potential spacecraft trajectory, using burst locations and spectra observed by the 1978-1980 inter-planetary network of gamma-ray detectors.

Improvements in the measurement of gamma-ray source positions may be expected from two directions. For steady sources and very bright transients, larger detectors will achieve improved signal-to-noise ratios and hence better source positions for a given angular resolution. However, the positions of most of the gamma-ray bursts are measured more accurately from the event delay times across interplanetary distances (Harris, 1991b). Progress in this field is dependent on future space mission launch schedules.

Particle Astronomy

Atomic Microscopic Particles

Another technique of astronomical investigation relies on the observation of microscopic particles which stream toward Earth in huge numbers from different directions. They include elementary particles such as electrons, protons, and heavier and complex atomic particles. The more energetic of these particles are frequently referred to as cosmic rays. Another amazing particle that could be use as an "information carrier" is the neutrino.

Neutrinos

A neutrino is a weakly interacting particle that travels at essentially the speed of the light and has an intrinsic angular momentum of 1/2 (h/4 PI). Neutrinos are produced on Earth by natural radioactivity, nuclear reactors, and high-energy accelerators. There are six types of neutrinos and three flavors of neutrinos and anti-neutrinos. Each are associated with a massive lepton that experiences weak, electromagnetic, and gravitational forces, but not strong interactions. The known leptons are electrons, muons, and taus (in increasing order of their rest masses).

Because neutrinos interact only weakly with matter, they can reach us from otherwise inaccessible regions where photons are trapped. Hence, with neutrinos, we can look inside stars and examine directly energetic physical processes that occur only in stellar interiors. Large detectors, consisting typically of hundreds or thousands of tons of material, are required to observe "astronomical neutrinos".

The neutrino burst detected from Supernova 1987A confirmed the basic theory of core collapse and refined our views of neutrino properties. Twenty neutrinos in the energy range from 6 to 39 MeV were detected over ~12 seconds (Chevalier, 1992). Given the distance to the Large Magellanic Cloud galaxy and the sensitivity of the instruments, the results were consistent with an emission of about 10exp58 neutrinos in the supernova. To have a real idea about the difficulties in the detection of this particle, it was estimated that during those ~12 seconds, more than 10exp11 neutrinos passed through

each square centimeter of Earth. Our technology was only capable of detecting twenty of them.

There have been several proposals to use collimated neutrino beams in the energy range from 1 to 100 GeV as a potential means for telecommunication over global distances of 10exp3 - 10exp4 kilometers (Saenz et al 1977, Uberall et al 1979). Similar proposals for telecommunication for not only global but also interstellar and intergalactic distances were investigated by Subotowicz (1979) and Pasachoff and Kutner (1979).

The main difficulty of all these ideas is the low cross-section of interaction of the neutrino and their very low detection efficiency. Subotowicz (1979) suggested that some advanced civilizations may deliberately shut out emergent civilizations such as ours from the conversation. Generation and detection of neutrinos is so difficult that an advanced civilization may purposely choose such a system in order to find and communicate only with their own level of development.

Electrons, Protons, and Heavy Particles (Cosmic Rays)

Highly energetic protons, neutrons, electrons, positrons, and a wide variety of heavier nucleons constitute the cloud of galactic cosmic ray particles. Anti-nucleons consisting of antimatter have been sought: During the 1980s, anti-protons were found. Unstable sub-nuclear particles are not expected to figure significantly as carriers of cosmic information. Their short lifetimes preclude travel over long distances in the Universe, unless the most extreme energies are assumed.

The energy range of galactic, or possible extragalactic, cosmic ray particles that we can hope to use as carriers of information lies between 10exp11 eV and 10exp21 eV. However, most of the stable cosmic rays are charged, therefore studies at high angular resolution, high spectral (energy) resolution, or high time resolution are not likely to yield a great deal of "information". Galactic magnetic fields scramble all "memory" of where and how the particles originated and make uncertain the time of origin, including the initial energy of the particle.

This kind of information carrier presents several disadvantages for interstellar communication. Due to the electric charge of electrons and protons and their interaction with the magnetic interstellar fields (~ 5x10exp(-6) Gauss), a Lorentz force will act on both particles, but with opposite direction. The relevant relativistic equations are V/c = ((1-(Mexp2 x cexp4))/Eexp2)exp(1/2) and R=MV/QB(1-Vexp2/cexp2)exp(1/2)sen(alpha), where c is the speed of light, V is the particle velocity, M is the particle mass, Q is charge, B is the magnetic flux density, E is the particle energy, R is the curvature radius, and alpha is the angle between the galactic field and the direction of the particle beam.

Assuming the beam is aimed properly, it will curve around and just barely reach the target if R is one-half the distance thereto (Freitas, 1977). If we send a message via high energy protons across ten light years, E must be at least 1.4x10exp16 eV if alpha equals ninety degrees. Of course this assumes a nice uniform B field all the way, a dubious proposition at best. In view of the galactic deflection problem, it is difficult to see how charged particle beams could represent a communication mode for advanced extraterrestrial civilizations.

Macroscopic Objects

The planet Earth is incessantly bombarded by matter whose information content is far from negligible. For example, the stream of extraterrestrial matter gives direct information about the abundance of the elements in the sites where the matter was produced, which mainly involves the history of the solar system. Meteorites are one such group of objects which can be handled and subjected to laboratory tests and analyzes. Meteoric dust brought to Earth by rain or snow can be studied in the same way. The difference here is that these particles or objects can be examined and re-examined in a leisurely way. They are not so transient as individual photons or fermions.

There have been some speculations that a simple biological system carrying a message and capable of self-replication in suitable environments may be one possible channel for interstellar communication (Yokoo and Oshima, 1979, and Nakamura, 1986). These kinds of ideas have several and severe objections. For example, the impossibility to predict the environment of the target star in order to favor the self-replication of the molecular structure, the impossibility to avoid the destruction of the content of the message by the molecular mutations, and the impossibility for us to distinguish between a "natural" organism and a real biological interstellar message.

Direct Techniques

With the development of the Space Age, the way has been opened for a more direct approach to many phases of extraterrestrial exploration. Such probes can transport sensing devices for direct measurements at distant locations and telemeter their findings back to Earth. The human race's capacity for observation and interpretation of diverse and unexpected phenomena make manned exploration the ultimate goal.

In the past thirty years, there have been several proposals of rapid space probes (v > 0.1 c) for interstellar travel purposes, including pulsed fusion and antimatter-powered rockets, laser-pushed light sails, and interstellar ramjets (Mallove and Matloff, 1989). The scale of the undertaking, from both a technological and economic perspective, is such that they are unlikely to be realized for at least one century (Crawford, 1990).

The most ignored factor in discussing interstellar flight is the kinetic energy that must be invested in the ship to make its tons of matter move at a substantial fraction of the speed of light (Oliver, 1981; Purcell, 1959; von Hoerner, 1962). This turns out to be the dominant energy requirement and is thus a useful lower bound on the total. If, in assessing the cost of interstellar travel, we find this lower bound too big, all the other costs can be negligible.

Bracewell (1960, 1975) and Freitas (1980a) have discussed the possible superiority of interstellar probes in missions of galactic exploration. Freitas (1980b) and Valdes and Freitas (1980) have raised the issue of self-organized machines in related context. The non-detectability of the proposed probes has been used as an argument to establish that we are the only technological civilization in the entire Milky Way galaxy (Tipler, 1980).

Under the assumption that an extraterrestrial probe will be interested in life in our solar system, a near-Earth search was carried out for these kinds of artificial objects by Freitas and Valdes (1980, 1983, 1985). Other proposals to search for extraterrestrial artifacts in our neighborhood were proposed by Papagiannis (1978, 1985).

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Yeomans, D. K., Chodas, P. W., Keesey, M. S., and Ostro, S. J., Asteroid and Comet Orbits Using Radar Data, Astronomical Journal, vol.103, pp.303-317, 1992

Yokoo, H., and Oshima, T., Is Bacteriophage PHI X 174 DNA a Message from an ETI?, Icarus, vol.38, pp.148-153, 1979

Errata -

The following are corrections of errors made in Part 1 of this article in the December 1993 issue of the EJASA. I regret the errors and apologize for them. I thank Guillermo A. Lemarchand for finding and correcting the information. - The Editor

The text reads:

TYPE II: A civilization capable of utilizing and channeling the entire radiation output of its star. The energy utilization would then be comparable to the luminosity of our Sun, about 4x1026 Watts.

It should read 4x10exp26 Watts.

The text reads:

structures in the range 3 Kelvin s T s 300 K, the consumption of energy in the range 1 Luminosity (Sun) s L s 10exp12 L(Sun), structures with sizes up to 100 kiloparsecs (kpc), and distances up to Dw 1000 megaparsecs (mpc). One parsec equals 3.26 light years.

It should read "3 Kelvin s Ts 300 K" (the symbol is minor or equal combination of < and =). The next line should read "1 Luminosity (Sun) s Ls 10exp12 L (Sun)". Where it says Dw 1000 megaparsecs (mpc) it should read "~ 1000 megaparsecs (Mpc)", using the symbol of "almost equal" and "Mpc", not milliparsecs (mpc).

The text reads:

now, only a small fraction of the whole Haystack has been explored (w 10exp(-15) - 10exp(-16)).

Instead of w it should read ~.

The text reads:

modest "Type 0" (w10exp13 W/Hz, Rw0.4 A.U., Dw5000 m, and lambdaw1 m) to the transition from "Type I" to "Type II" (w2x10exp24 W/Hz, Rw0.4 A.U., Dw10 m, lambdaw1 mm).

Replace w per ~, and Rw per r, Dw per ~, and so on.

The text reads:

In 1993, MANIA was used from the 2.15-meter telescope of the Complejo Astronomico El Leoncito in Argentina, to examine fifty nearby solar-type stars for the presence of laser pulses (Lemarchand et al, 1993).

This MANIA project did *not* take place in 1993.

The text reads:

resonance line. If we consider that the typical spectral line width might be about 1, and if we assume that a ten percent absorption

After 1 it should read 1 armstrong.

The Author -

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141. ARLS003 New OSCAR on soon

Newsgroup: rec.radio.amateur.space
Date: 1994-01-26 17:34:57 UTC
From: lhurder@arrl.org
Message-ID: <$arls003.1994@ampr.org>
Source record: 28195
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SPACE @ ARL $ARLS003
ARLS003 New OSCAR on soon

ZCZC AS47
QST de W1AW
Space Bulletin 003 ARLS003
From ARRL Headquarters
Newington, CT January 25, 1994
To all radio amateurs

SB SPACE ARL ARLS003
ARLS003 New OSCAR on soon

New Oscar on soon

Amateur satellite Korean Oscar 25 (KO-25) is expected to be available for use beginning about February 1. The satellite, launched last fall and originally designated KITSAT-B, has been under test since then.

KO-25 is a 9600 bit/s packet store-and-forward satellite similar to KO-23, with uplinks on 2 meters and downlinks on 70 cm.

KO-25's builder, the Korean Advanced Institute of Science and Technology (KAIST), thanks potential users of the satellite for their cooperation up to now in not attempting to use the KO-25 BBS.

The Institute said that testing is expected to continue after February 1, and there may be interruptions of service, but they are not expected to cause any ''serious problems.''

''We hope you enjoy our new star in space,'' said Hyungshin Kim of KAIST.

More information on KO-25 was in October 1993 QST, page 98.
NNNN
/EX

142. Daily IPS Report - 26 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-27 05:29:24 UTC
From: dave@eram.esi.com.au
Message-ID: <5145@eram.esi.com.au>
Source record: 28197
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 25 January 1994
Summary for 25 January and Forecast up to 28 January
IPS Warning 02 was issued on 25 January and is
current for the interval Jan 27-29.

1A. SOLAR SUMMARY
Activity: moderate

Flares Max Fadeout Begin End Freq. Sectors
M1/1N 1836UT none

Observed 10.7 cm flux/Equivalent Sunspot Number : 132/086

1B. SOLAR FORECAST
26 January 27 January 28 January
Activity Low Low Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 130/084

1C. SOLAR COMMENT
One solar region has shown rapid growth overnight.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet

Estimated Indices : A K Observed A Index 24 January
Learmonth 04 2211 1012
Fredericksburg 05 03
Planetary 05 03

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
26 Jan 10 Quiet.
27 Jan 20 Unsettled to active.
28 Jan 20 Unsettled to active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

25 Jan normal normal normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
26 Jan normal normal fair
27 Jan normal fair poor
28 Jan normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Degraded HF comms expected for mid and high lats during interval
Jan 27-29.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 15-30% enhanced 00-14 UT, then return to near
monthly values.

T index: 82

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
26 Jan 40 Near predicted monthly values.
27 Jan 30 Near predicted monthly values.
28 Jan 30 Near predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded HF comms expected during Jan 27-29.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

143. Daily IPS Report - 27 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-27 05:30:04 UTC
From: dave@eram.esi.com.au
Message-ID: <5146@eram.esi.com.au>
Source record: 28194
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 26 January 1994
Summary for 26 January and Forecast up to 29 January
IPS Warning 02 was issued on 24 Jan and is still current.

1A. SOLAR SUMMARY
Activity: Moderate

Flares: M1/0F at 0136UT

Observed 10.7 cm flux/Equivalent Sunspot Number : 128/81

1B. SOLAR FORECAST
27 January 28 January 29 January
Activity Low to moderate Low to moderate Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 130/84

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : Mostly unsettled with active periods
from 06-09UT and 12-15UT.

Estimated Indices : A K Observed A Index 25 January
Learmonth 17 3343 4233
Fredericksburg 17 05
Planetary 15 04

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
27 Jan 20 Unsettled to active.
28 Jan 18 Unsettled to active.
29 Jan 12 Unsettled.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
26 Jan normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
27 Jan normal normal fair-normal
28 Jan normal normal fair-normal
29 Jan normal normal fair-normal
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted with 15-40% enhancements from
09-14UT and at 18UT.

T index: 56

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
27 Jan 50 Near predicted to 20% enhanced.
28 Jan 45 Near predicted to 20% enhanced.
29 Jan 45 Near predicted to 20% enhanced.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

144. Daily IPS Report - 28 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 02:23:11 UTC
From: dave@eram.esi.com.au
Message-ID: <5151@eram.esi.com.au>
Source record: 28209
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 27 January 1994
Summary for 27 January and Forecast up to 30 January
IPS Warning 02 was issued on 24 Jan and is still current.

1A. SOLAR SUMMARY
Activity: moderate

Flares Max Fadeout Begin End Freq. Sectors
M2/SN 0510UT confirmed 0508UT 0540UT lower E. Asia/Aust.

Observed 10.7 cm flux/Equivalent Sunspot Number : 120/072

1B. SOLAR FORECAST
28 January 29 January 30 January
Activity Low to moderate Low to moderate Low to moderate
Fadeouts Possible Possible Possible

Forecast 10.7 cm flux/Equivalent Sunspot Number : 120/072

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled with active levels from
15-18UT

Estimated Indices : A K Observed A Index 26 January
Learmonth 13 3233 3332
Fredericksburg 15 17
Planetary 22 17

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
28 Jan 18 Mostly unsettled with an isolated active period.
29 Jan 12 Quiet to unsettled.
30 Jan 08 Quiet to unsettled.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

27 Jan fair-normal fair-normal fair-normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
28 Jan fair-normal fair-normal fair-normal
29 Jan normal fair-normal fair-normal
30 Jan normal fair-normal normal
3C. GLOBAL HF PROPAGATION COMMENT
Chance of fadeout on daylight circuits.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were mostly 15-30% above monthly predicted values, and
30-50% above from 08-10UT and 13-14UT. Sporadic E may have affected F
layer communications during daylight hours. A fadeout in response to
the M2 flare occurred from 0508-0540UT.

T index: 81

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
28 Jan 45 Near predicted to 20% enhanced.
29 Jan 45 Near predicted to 20% enhanced.
30 Jan 45 Near predicted to 20% enhanced.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Sporadic E may affect F layer communications, particularly during
daylight hours. Chance of fadeout on daylight circuits.
--
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dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

145. Weekly IPS Report - 28 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 02:24:05 UTC
From: dave@eram.esi.com.au
Message-ID: <5152@eram.esi.com.au>
Source record: 28208
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

21 JANUARY - 27 JANUARY 1994

Issue No 04
Date of issue: 28 January, 1994

INDICES:
Date 21 22 23 24 25 26 27
10cm 111 113 118 129 132 128 120
A 07 09 07 03 05 17 (15)
T 38 53 75 73 82 56 81

SUMMARY OF ACTIVITY

January 21
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was quiet to unsettled.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values.

January 22
Solar activity was low.
The geomagnetic field at Learmonth (WA) was quiet to unsettled.
Ionospheric F2 critical frequencies at Sydney were slightly above
predicted monthly values.

January 23
Solar activity was low.
The geomagnetic field at Learmonth (WA) was quiet to unsettled.
Ionospheric F2 critical frequencies at Sydney were about 15% above
predicted monthly values.

January 24
Solar activity was low.
The geomagnetic field at Learmonth (WA) was quiet.
Ionospheric F2 critical frequencies at Sydney were about 15% above
predicted monthly values.

.SK
January 25
Solar activity was moderate, with an M1/1N flare at 1836UT.
The geomagnetic field at Learmonth (WA) was quiet.
Ionospheric F2 critical frequencies at Sydney were 15-30% enhanced
00-14 UT, then near predicted monthly values.

January 26
Solar activity was moderate, with an M1/0F flare at 0136UT.

The geomagnetic field at Learmonth (WA) was mostly unsettled with
active periods from 06-09UT and 12-15UT.
Ionospheric F2 critical frequencies at Sydney were near predicted
with 15-40% enhancements from 09-14UT and at 18UT.

January 27
Solar activity was moderate, with an M2/0N flare at 0510UT.
The geomagnetic field at Learmonth (WA) was unsettled with active
levels from 15-18UT.
Ionospheric F2 critical frequencies at Sydney were mostly 15-30%
above monthly predicted values, 30-50% above from 08-10UT and
13-14UT. Sporadic E may have affected F layer communications during
daylight hours. A fadeout in response to the M2 flare occurred from
0508-0540UT.

FORECAST FOR THE NEXT WEEK (28 - 3 FEBRUARY)

SOLAR: Low to moderate

GEOMAGNETIC: Quiet to unsettled

IONOSPHERIC: Near predicted to 20% above monthly predicted values.
Possibility of fadeouts on daylight circuits.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

146. ORBS$028.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 05:02:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-028.o.1994@ampr.org>
Source record: 28200
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-028.O
Orbital Elements 028.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX January 28, 1994
BID: $ORBS-028.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94024.05103246
Element set: 255
Inclination: 27.1974 deg
RA of node: 345.0665 deg
Eccentricity: 0.6022479
Arg of perigee: 148.8987 deg
Mean anomaly: 267.9531 deg
Mean motion: 2.05878528 rev/day
Decay rate: -1.57e-06 rev/day^2
Epoch rev: 7981
Checksum: 331

Satellite: UO-11
Catalog number: 14781
Epoch time: 94022.54990237
Element set: 659
Inclination: 97.7943 deg
RA of node: 44.0471 deg
Eccentricity: 0.0012732
Arg of perigee: 20.1247 deg
Mean anomaly: 340.0459 deg
Mean motion: 14.69126429 rev/day
Decay rate: 2.20e-06 rev/day^2
Epoch rev: 52892
Checksum: 298

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94024.51112470
Element set: 856
Inclination: 82.9229 deg
RA of node: 75.0490 deg
Eccentricity: 0.0013261
Arg of perigee: 65.1117 deg
```

Mean anomaly: 295.1421 deg
Mean motion: 13.72330004 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 33020
Checksum: 251

Satellite: AO-13
Catalog number: 19216
Epoch time: 94024.72776868
Element set: 868
Inclination: 57.8659 deg
RA of node: 271.7520 deg
Eccentricity: 0.7209858
Arg of perigee: 333.3841 deg
Mean anomaly: 3.3067 deg
Mean motion: 2.09727795 rev/day
Decay rate: -4.74e-06 rev/day^2
Epoch rev: 4300
Checksum: 343

Satellite: FO-20
Catalog number: 20480
Epoch time: 94022.02498298
Element set: 653
Inclination: 99.0150 deg
RA of node: 201.5769 deg
Eccentricity: 0.0540715
Arg of perigee: 310.7310 deg
Mean anomaly: 44.8065 deg
Mean motion: 12.83224067 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 18538
Checksum: 283

Satellite: AO-21
Catalog number: 21087
Epoch time: 94022.59338267
Element set: 418
Inclination: 82.9419 deg
RA of node: 250.4473 deg
Eccentricity: 0.0036137
Arg of perigee: 127.9378 deg
Mean anomaly: 232.5054 deg
Mean motion: 13.74532122 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 14958
Checksum: 311

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94023.25486395

Element set: 657
Inclination: 82.9234 deg
RA of node: 118.9396 deg
Eccentricity: 0.0029748
Arg of perigee: 149.4078 deg
Mean anomaly: 210.8818 deg
Mean motion: 13.74034012 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 14874
Checksum: 336

/EX

147. ORBS$028.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 05:04:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-028.d.1994@ampr.org>
Source record: 28201
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-028.D
Orbital Elements 028.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX January 28, 1994
BID: $ORBS-028.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94023.72027674
Element set: 958
Inclination: 98.6014 deg
RA of node: 110.4232 deg
Eccentricity: 0.0010738
Arg of perigee: 258.1040 deg
Mean anomaly: 101.8939 deg
Mean motion: 14.29818845 rev/day
Decay rate: 9.0e-07 rev/day^2
Epoch rev: 20894
Checksum: 300

Satellite: AO-16
Catalog number: 20439
Epoch time: 94023.71142341
Element set: 759
Inclination: 98.6085 deg
RA of node: 111.4985 deg
Eccentricity: 0.0010626
Arg of perigee: 257.4103 deg
Mean anomaly: 102.5891 deg
Mean motion: 14.29874323 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 20895
Checksum: 302

Satellite: DO-17
Catalog number: 20440
Epoch time: 94023.19000664
Element set: 758
Inclination: 98.6093 deg
RA of node: 111.2588 deg
Eccentricity: 0.0010786
Arg of perigee: 258.6026 deg
```

Mean anomaly: 101.3939 deg
Mean motion: 14.30012183 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 20889
Checksum: 287

Satellite: WO-18
Catalog number: 20441
Epoch time: 94023.72257873
Element set: 759
Inclination: 98.6090 deg
RA of node: 111.7965 deg
Eccentricity: 0.0011363
Arg of perigee: 257.4262 deg
Mean anomaly: 102.5650 deg
Mean motion: 14.29988660 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 20897
Checksum: 317

Satellite: LO-19
Catalog number: 20442
Epoch time: 94023.78031134
Element set: 758
Inclination: 98.6095 deg
RA of node: 112.0754 deg
Eccentricity: 0.0011686
Arg of perigee: 257.0604 deg
Mean anomaly: 102.9274 deg
Mean motion: 14.30082457 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 20899
Checksum: 296

Satellite: UO-22
Catalog number: 21575
Epoch time: 94022.73955110
Element set: 459
Inclination: 98.4491 deg
RA of node: 100.0846 deg
Eccentricity: 0.0008316
Arg of perigee: 9.2228 deg
Mean anomaly: 350.9110 deg
Mean motion: 14.36884103 rev/day
Decay rate: 7.7e-07 rev/day^2
Epoch rev: 13219
Checksum: 283

Satellite: KO-23
Catalog number: 22077
Epoch time: 94023.85609254

Element set: 354
Inclination: 66.0869 deg
RA of node: 222.1744 deg
Eccentricity: 0.0008987
Arg of perigee: 324.6351 deg
Mean anomaly: 35.4071 deg
Mean motion: 12.86283752 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 6822
Checksum: 309

Satellite: AO-27
Catalog number: 22825
Epoch time: 94024.20805866
Element set: 256
/EX

148. ORBS$028.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 05:06:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-028.w.1994@ampr.org>
Source record: 28202
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-028.W
Orbital Elements 028.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX January 28, 1994
BID: $ORBS-028.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94024.84111918
Element set: 690
Inclination: 99.0714 deg
RA of node: 73.5136 deg
Eccentricity: 0.0014254
Arg of perigee: 265.0534 deg
Mean anomaly: 94.9011 deg
Mean motion: 14.13582049 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 47009
Checksum: 295

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94024.90557717
Element set: 589
Inclination: 98.5115 deg
RA of node: 38.2683 deg
Eccentricity: 0.0014216
Arg of perigee: 30.0469 deg
Mean anomaly: 330.1524 deg
Mean motion: 14.24859195 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 38220
Checksum: 311

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94023.43390413
Element set: 256
Inclination: 82.5388 deg
RA of node: 23.7309 deg
Eccentricity: 0.0015197
Arg of perigee: 225.1306 deg
```

Mean anomaly: 134.8627 deg
Mean motion: 13.84705138 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 30232
Checksum: 282

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94022.60025047
Element set: 258
Inclination: 82.5388 deg
RA of node: 66.7138 deg
Eccentricity: 0.0015665
Arg of perigee: 267.7785 deg
Mean anomaly: 92.1551 deg
Mean motion: 13.16963643 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26409
Checksum: 316

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94024.88940835
Element set: 493
Inclination: 99.1591 deg
RA of node: 10.3872 deg
Eccentricity: 0.0011598
Arg of perigee: 172.3595 deg
Mean anomaly: 187.7754 deg
Mean motion: 14.12952794 rev/day
Decay rate: 1.09e-06 rev/day^2
Epoch rev: 27498
Checksum: 345

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94023.59752591
Element set: 257
Inclination: 82.5221 deg
RA of node: 259.1929 deg
Eccentricity: 0.0013085
Arg of perigee: 276.2886 deg
Mean anomaly: 83.6783 deg
Mean motion: 13.84355919 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 24768
Checksum: 350

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94025.10426049

Element set: 975
Inclination: 82.5515 deg
RA of node: 8.9014 deg
Eccentricity: 0.0005987
Arg of perigee: 291.9052 deg
Mean anomaly: 68.1464 deg
Mean motion: 13.04413358 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 20424
Checksum: 280

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94023.30001472
Element set: 758
Inclination: 82.5480 deg
RA of node: 323.5522 deg
Eccentricity: 0.0014995
Arg of perigee: 189.5054 deg
Mean anomaly: 170.5826 deg
Mean motion: 13.84186867 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18057
/EX

149. ORBS$028.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 05:08:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-028.m.1994@ampr.org>
Source record: 28198
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-028.M
Orbital Elements 028.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX January 28, 1994
BID: $ORBS-028.M
TO ALL RADIO AMATEURS BT

Satellite: MIR
Catalog number: 16609
Epoch time: 94024.89373306
Element set: 113
Inclination: 51.6149 deg
RA of node: 185.5066 deg
Eccentricity: 0.0004274
Arg of perigee: 238.4510 deg
Mean anomaly: 121.6066 deg
Mean motion: 15.59707808 rev/day
Decay rate: 3.418e-05 rev/day^2
Epoch rev: 45369
Checksum: 305

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94022.24851824
Element set: 430
Inclination: 28.4686 deg
RA of node: 93.3100 deg
Eccentricity: 0.0006047
Arg of perigee: 4.5503 deg
Mean anomaly: 355.5137 deg
Mean motion: 14.90434303 rev/day
Decay rate: 8.56e-06 rev/day^2
Epoch rev: 759
Checksum: 266

Satellite: GRO
Catalog number: 21225
Epoch time: 94021.73753211
Element set: 57
Inclination: 28.4607 deg
RA of node: 168.1175 deg
Eccentricity: 0.0003410
Arg of perigee: 4.1032 deg
```

Mean anomaly: 355.9593 deg
Mean motion: 15.39868197 rev/day
Decay rate: 3.487e-05 rev/day^2
Epoch rev: 3433
Checksum: 282

Satellite: UARS
Catalog number: 21701
Epoch time: 94022.08009544
Element set: 466
Inclination: 56.9837 deg
RA of node: 24.5158 deg
Eccentricity: 0.0005011
Arg of perigee: 99.9306 deg
Mean anomaly: 260.2285 deg
Mean motion: 14.96313760 rev/day
Decay rate: -1.61e-06 rev/day^2
Epoch rev: 12906
Checksum: 281

Satellite: POSAT
Catalog number: 22829
Epoch time: 94024.17496986
Element set: 249
Inclination: 98.6636 deg
RA of node: 101.3681 deg
Eccentricity: 0.0009514
Arg of perigee: 260.3974 deg
Mean anomaly: 99.6130 deg
Mean motion: 14.27999725 rev/day
Decay rate: 1.12e-06 rev/day^2
Epoch rev: 1714
Checksum: 324

/EX

150. ORBS$028.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 05:10:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-028.n.1994@ampr.org>
Source record: 28203
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-028.N
2Line Orbital Elements 028.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX January 28, 1994
BID: $ORBS-028.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94024.05103246 -.00000157 00000-0 10000-3 0 2554
2 14129 27.1974 345.0665 6022479 148.8987 267.9531 2.05878528 79816
UO-11
1 14781U 84021B 94022.54990237 .00000220 00000-0 45296-4 0 6599
2 14781 97.7943 44.0471 0012732 20.1247 340.0459 14.69126429528928
RS-10/11
1 18129U 87054A 94024.51112470 .00000029 00000-0 15038-4 0 8569
2 18129 82.9229 75.0490 0013261 65.1117 295.1421 13.72330004330209
AO-13
1 19216U 88051B 94024.72776868 -.00000474 00000-0 10000-4 0 8687
2 19216 57.8659 271.7520 7209858 333.3841 3.3067 2.09727795 43003
FO-20
1 20480U 90013C 94022.02498298 .00000032 00000-0 15169-3 0 6533
2 20480 99.0150 201.5769 0540715 310.7310 44.8065 12.83224067185384
AO-21
1 21087U 91006A 94022.59338267 .00000094 00000-0 82657-4 0 4185
2 21087 82.9419 250.4473 0036137 127.9378 232.5054 13.74532122149583
RS-12/13
1 21089U 91007A 94023.25486395 .00000069 00000-0 56901-4 0 6578
2 21089 82.9234 118.9396 0029748 149.4078 210.8818 13.74034012148747
UO-14
1 20437U 90005B 94023.72027674 .00000090 00000-0 52127-4 0 9588
2 20437 98.6014 110.4232 0010738 258.1040 101.8939 14.29818845208942
AO-16
1 20439U 90005D 94023.71142341 .00000036 00000-0 30887-4 0 7596
2 20439 98.6085 111.4985 0010626 257.4103 102.5891 14.29874323208955
DO-17
1 20440U 90005E 94023.19000664 .00000033 00000-0 29953-4 0 7589
```

```
2 20440 98.6093 111.2588 0010786 258.6026 101.3939 14.30012183208890
WO-18
1 20441U 90005F 94023.72257873 .00000022 00000-0 25461-4 0 7594
2 20441 98.6090 111.7965 0011363 257.4262 102.5650 14.29988660208975
LO-19
1 20442U 90005G 94023.78031134 .00000035 00000-0 30616-4 0 7582
2 20442 98.6095 112.0754 0011686 257.0604 102.9274 14.30082457208994
UO-22
1 21575U 91050B 94022.73955110 .00000077 00000-0 40784-4 0 4595
2 21575 98.4491 100.0846 0008316 9.2228 350.9110 14.36884103132190
KO-23
1 22077U 92052B 94023.85609254 -.00000037 00000-0 10000-3 0 3543
2 22077 66.0869 222.1744 0008987 324.6351 35.4071 12.86283752 68225
AO-27
1 22825U 93061C 94024.20805866 .00000024 00000-0 27909-4 0 2565
2 22825 98.6679 101.3787 0008002 272.5619 87.4646 14.27602782 17142
IO-26
1 22826U 93061D 94024.19945571 .00000014 00000-0 23681-4 0 2575
2 22826 98.6696 101.3894 0008709 274.0164 86.0022 14.27705052 17144
KO-25
1 22830U 93061H 94023.12145410 .00000032 00000-0 30191-4 0 2581
2 22830 98.5680 99.1055 0010832 241.2500 118.7594 14.28028626 16999
NOAA-9
1 15427U 84123A 94024.84111918 .00000066 00000-0 59541-4 0 6907
/EX
```

151. * SpaceNews 31-Jan-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-01-28 16:35:05 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0131.1994@ampr.org>
Source record: 28199
Cross-posted to: rec.radio.amateur.space,rec.radio.info,sci.space.news

```
SB NEWS @ AMSAT $SPC0131
* SpaceNews 31-Jan-94 *

BID: $SPC0131

=========
SpaceNews
=========

MONDAY JANUARY 31, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* STS-60 KEPLERIAN DATA *
=========================
The following is pre-launch Keplerian orbital data for Shuttle mission
STS-60 which has an expected launch date of 03-Feb-94 at 12:10 UTC:

STS-60
1 00060U 94034.56756353 .00033600 00000-0 25200-3 0 47
2 00060 57.0033 215.8607 0010675 264.1500 95.8328 15.72291901 26

Satellite: STS-60
Catalog number: 00060
Epoch time: 94034.56756353 (03-FEB-94 13:37:17.49 UTC)
Element set: 004
Inclination: 57.0033 deg
RA of node: 215.8607 deg Space Shuttle Flight STS-60
Eccentricity: .0010675 Prelaunch Element set JSC-004
Arg of perigee: 264.1500 deg Launch: 03-FEB-94 12:10 UTC
Mean anomaly: 95.8328 deg
Mean motion: 15.72291901 rev/day Gil Carman, WA5NOM
Decay rate: 3.3600e-04 rev/day*2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 254

[Info via N6JLS]

* NEWS FROM JAPAN *
===================
The first H-II launch will take place between 7:00 - 9:00 AM (JST=UTC+9h)
on 01-Feb-94.

[Info via Yoshiro Yamada]
```

* TUBSAT-B AND METEOR-3 LAUNCHED *
==========
TUBSAT-B is the second scientific Microsatellite build by the Technical University of Berlin (TUB), Germany.

It was launched 25-Jan-94 from Plesetsk, Russia at 00:25 UTC together with the new Russian meteorological satellite METEOR-3. TUBSAT-B successfully separated from METEOR-3 at 09:42:50 UTC.

TUBSAT-B Downlink is on 143.075 MHz with FFSK Modulation. The beacon is transmitting a 2 second burst every 2 minutes. The satellite has not yet been heard by it's command station. Although it is not a ham radio satellite, any report is most welcome. Reports can be sent via packet radio to DL4OAD @ DK0MAV.DEU.EU

METEOR-3 Keplerian elements:

Reference Epoch 94 025.23119078
Inclination 82.5637 deg
RAAN 157.1120 deg
Eccentricity 0.0014635
Argument of Perigee 262.7207 deg
Mean Anomaly 97.2234 deg
Mean Motion 13.16729004 rev/day
Decay Rate 5.0e-8 rev/day/day
Revolution Number At Epoch 3

[Info via Peter Guelzow, DB2OS]

* OSCAR-13 NEWS *
==========
Magnetorquing from attitude 246/-3 to 180/0 commenced on Jan 28 [Fri] 00:02 UTC, orbit 4306/224, and will continue for 8 perigees. Estimated interim attitudes are: Orbit Alon/Alat: 4307 236/-5: 4308 227/-7: 4309 217/-10: 4310 209/-13: 4313 200/-10: 4314 192/-8: 4315 184/-5:
/EX

152. Anik Satellite Troubles

Newsgroup: rec.radio.amateur.space
Date: 1994-01-29 16:47:06 UTC
From: dv736@cleveland.Freenet.Edu
Message-ID: <2ie3ua$i1n@usenet.INS.CWRU.Edu>
Source record: 28210

Does anyone have the latest information on what is happening to
the Canadian Satellite Anik E1 and E2. The Wall Street Journal
Reported that these 2 satellites were damaged by a electrostatic
disturbance which upset the ability of the bird to stay pointed
at the earth. Most of the Canadian programming was on what I
called A1 and there is no signal from that guy right now. The
other Anik satellite which only had a few video transponders is
now loaded with some of the video formerly on A1. Thanks.
--
John S. Papay K8YSE
dv736@cleveland.freenet.edu

153. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-01-29 16:50:00 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.759815870@afit.af.mil>
Source record: 28204
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.info on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (also updated daily) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a eleven-character name.

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BST
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

154. Two-Line Orbital Element Sets (TLE333)

Newsgroup: rec.radio.amateur.space
Date: 1994-01-29 16:50:00 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.759816024@afit.af.mil>
Source record: 28205
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #333 -
Alouette 1
1 00424U 62049 94027.61004690 .00000059 00000-0 58777-4 0 9621
2 00424 80.4627 63.7071 0024292 115.1371 245.2298 13.67795672563189
ATS 3
1 03029U 67111A 94021.26837622 -.00000106 00000-0 10000-3 0 1581
2 03029 14.5529 9.0158 0011611 265.0113 197.6305 1.00273115 95963
Cosmos 398
1 04966U 71016A 94028.31361434 .00096947 61103-5 22682-3 0 9734
2 04966 51.4637 146.5845 1172118 318.8956 32.9710 13.53827359753549
Starlette
1 07646U 75010A 94024.19925559 -.00000198 00000-0 -44857-4 0 7541
2 07646 49.8254 1.5501 0206178 220.6614 137.8728 13.82184417957932
LAGEOS
1 08820U 76039A 94023.41512066 .00000017 00000-0 10000-3 0 9606
2 08820 109.8423 86.0157 0044111 316.2635 43.4722 6.38664634157901
ETS-2
1 09852U 77014A 94023.64131451 -.00000349 00000-0 10000-3 0 9470
2 09852 11.8975 43.2631 0000491 342.8997 99.7274 1.00016839 9210
GOES 2
1 10061U 77048A 94026.66442257 .00000075 00000-0 10000-3 0 2787
2 10061 10.9404 47.4404 0001399 316.7429 226.1117 1.00266207 5699
IUE
1 10637U 78012A 94026.19373972 -.00000249 00000-0 10000-3 0 9672
2 10637 34.3855 97.1995 1304821 31.6836 13.2418 1.00250701 11303
GPS BI-01
1 10684U 78020A 94020.30746349 -.00000020 00000-0 10000-3 0 2492
2 10684 64.5601 49.9219 0063173 163.5356 196.7308 1.98069486102004
GPS BI-02
1 10893U 78047A 94013.01692972 -.00000038 00000-0 10000-3 0 414
```

```
2 10893 63.6070 289.3866 0211600 13.5865 347.0949 2.01627402114944
GOES 3
1 10953U 78062A 94027.74112667 .00000069 00000-0 10000-3 0 2719
2 10953 9.8648 50.1335 0004891 120.6479 47.3222 1.00271928 10318
SeaSat 1
1 10967U 78064A 94027.66275395 .00000009 00000-0 47474-4 0 2614
2 10967 107.9980 171.3825 0002283 231.8848 128.2086 14.37915350816162
GPS BI-03
1 11054U 78093A 94027.16611214 .00000014 00000-0 10000-3 0 1566
2 11054 63.2883 285.9194 0043517 176.3942 183.7143 1.93505383111785
Nimbus 7
1 11080U 78098A 94027.67403545 -.00000024 00000-0 16826-4 0 3626
2 11080 99.0717 276.3968 0009339 145.8595 214.3162 13.83728760770645
GPS BI-04
1 11141U 78112A 94027.35139441 .00000022 00000-0 00000+0 0 8575
2 11141 64.5654 50.7079 0048296 24.7507 335.5502 1.92895049 1069
GPS BI-05
1 11690U 80011A 94024.31043962 .00000018 00000-0 10000-3 0 7557
2 11690 64.8427 51.6444 0139252 181.9032 177.4469 2.00555075116656
GPS BI-06
```

155. New Meteor? Where?

Newsgroup: rec.radio.amateur.space
Date: 1994-01-29 19:47:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.298.1818.0NC5D7A0@compart.fi>
Source record: 28206

According to AW&ST the new Meteor 3 satellite will be launched in the end of January. Does anyone know when was this launch happened and what is the frequency of the satellite?

Leo Wikholm
e-mail: leo.wikholm@compart.fi

156. InstantTrack Fix

Newsgroup: rec.radio.amateur.space
Date: 1994-01-29 23:12:58 UTC
From: somers@satsar.rmc.ca
Message-ID: <2ieqhq$meb@cs6.rmc.ca>
Source record: 28011

Some time ago, a fix for InstantTrack appeared on BBSs to fix the problem of the new checksums in 2-line elsets. I got the fix from a BBS and applied it and it worked fine. However, I recently reloaded my InstantTrack and realized I cannot find the "fix" program. Anyone know of an Internet or BBS location where I could get it. Thanks.

157. Re: InstantTrack Fix

Newsgroup: rec.radio.amateur.space
Date: 1994-01-30 01:21:39 UTC
From: jpd@ucs.usl.edu
Message-ID: <1994Jan30.012139.19501@usl.edu>
Source record: 28207

In article <2ieqhq$meb@cs6.rmc.ca>, Phil Somers <somers@satsar.rmc.ca> wrote:
> Some time ago, a fix for InstantTrack appeared on BBSs to fix the
>problem of the new checksums in 2-line elsets. I got the fix from a BBS and
>applied it and it worked fine. However, I recently reloaded my InstantTrack
>and realized I cannot find the "fix" program. Anyone know of an Internet
>or BBS location where I could get it. Thanks.
>
Phil, I put lots of satellite progs, including the patch you need, on
PC.USL.EDU in the pub/ham/sat directory.

73,

--
-- James Dugal, N5KNX Internet: jpd@usl.edu
Associate Director Ham packet: n5knx @k5arh (land), UO-22 (sat.)
Computing Center US Mail: PO Box 42770 Lafayette, LA 70504
University of Southwestern LA. Tel. 318-231-6417 U.S.A.

158. ANS-029 BULLETINS, DOVE WATCHERS TO BE RECOGNIZED

Newsgroup: rec.radio.amateur.space
Date: 1994-01-30 19:10:57 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-028.01.1994@ampr.org>
Source record: 28018
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-028.01
DOVE WATCHERS TO BE RECOGNIZED

HR AMSAT NEWS SERVICE BULLETIN 028.01 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.01

DOVE (DO-17) Telemetry Watchers Will Be Recognized

This weekend the DOVE (DO-17) Command Team will begin using the DOVE text message frame to transmit the callsigns of everyone who has sent a DOVE reception report to Dr. Junior Torres De Castro (PY2BJO) of the Brazilian AMSAT Group, BRAMSAT, the owner of DOVE. Because of the limited length of that frame, about 15 calls will be sent at a time and the message will be changed about every 3 or 4 days. This is the DOVE Ground Command Team's way of thanking everyone who has sent in reports (several hundred at present). Special DOVE QSL cards will also be mailed to those who have reported DOVE reception to PY2BJO. We are particularly interested in hearing about the equipment used and the quality of the signals. We would also like to hear about the use of DOVE signals or data in education. Actual telemetry is not needed at this time.

Please send reports to:

Dr. Junior Torres De Castro (PY2BJO)
119 Macaubal
Sao Palo
Brazil 01254

[The AMSAT News Service would like to thank Jim White (WD0E) and the DOVE Command Team for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-028.02
ANTENNA PORLARIZATION REVISITED

HR AMSAT NEWS SERVICE BULLETIN 028.02 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.02

Antenna Polarization Sense Revisited By WD0E

There have been many discussions occurring on Compuserve's HAMNET forum and in various corners of the amateur radio community about the need for

antenna polarity switching while using the OSCAR satellites. DOVE Command Team member Jim White (WD0E) wants to add some futher comments about this important issue based on his years of experience working with the MICROSATs.

Case For Polarization Switching

"The following is based on design data, direct measurements and experimentation, surveys, and anecdotal evidence from discussion threads on the digital birds and Compuserve. I believe the empirical data is correct, but an error or two could certainly have crept in. I submit it for discussion and comment. The sense (right or left) of the circular polarization of the four original MICROSATs changes depending on the transmitter in use. There was no attempt to make a particular transmitter any sense. The way they came out was based on how the semi-rigid cable and components could be designed into the transmitter module. Here is a list of the sense of each one:

AO-16 RC 437.050 RHCP
AO-16 PSK 437.025 LHCP
DO-17 XMTR A 145.825 LHCP
DO-17 XMTR B 145.825 RHCP
WO-18 RC 437.100 RHCP
WO-18 PSK 437.075
LO-19 RC (&CW) 437.125 RHCP
LO-19 PSK 437.050 LHCP

The AO-16 PSK XMTR and the WO-18 PSK XMTR have problems and are not presently in use (although the AO-16 PSK transmitter - with LHCP - was
/EX

159. Daily IPS Report - 29 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 02:26:02 UTC
From: dave@eram.esi.com.au
Message-ID: <5155@eram.esi.com.au>
Source record: 28012
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 28 January 1994
Summary for 28 January and Forecast up to 31 January
IPS Warning 02 was issued on 24 January and expires today.

1A. SOLAR SUMMARY
Activity: moderate

Flares Max Fadeout Begin End Freq. Sectors
M1/-- 1852UT none

Observed 10.7 cm flux/Equivalent Sunspot Number : 119/071

1B. SOLAR FORECAST
29 January 30 January 31 January
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 115/066

1C. SOLAR COMMENT
The sunspot group that has been producing the recent low level
M class flares is now on the west limb of the Sun. Another
region has returned to the east limb. This region showed
some magnetic complexity on its past transition but did not
produce any significant flares.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet to unsettled

Estimated Indices : A K Observed A Index 27 January
Learmonth 10 3323 3221
Fredericksburg 15 17
Planetary 17 16

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
29 Jan 12 Quiet to unsettled.
30 Jan 12 Quiet to unsettled.
31 Jan 12 Quiet to unsettled.

2C. MAGNETIC COMMENT
Further active periods from coronal hole do not seem likely.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
28 Jan normal normal normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
29 Jan normal normal fair
30 Jan normal normal fair
31 Jan normal normal fair
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values

T index: 41

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
29 Jan 40 Near predicted monthly values.
30 Jan 40 Near predicted monthly values.
31 Jan 40 Near predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

160. Daily IPS Report - 30 Jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 02:26:42 UTC
From: dave@eram.esi.com.au
Message-ID: <5156@eram.esi.com.au>
Source record: 28013
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 29 January 1994
Summary for 29 January and Forecast up to 1 February
No warning is current.

1A. SOLAR SUMMARY
Activity: moderate

Flares Max Fadeout Begin End Freq. Sectors
M2 X-ray 0413UT Probable - - lower East Asia
M2 X-ray 1129UT Probable - - lower European

Observed 10.7 cm flux/Equivalent Sunspot Number : 102/050

1B. SOLAR FORECAST
30 January 31 January 01 February
Activity Low Very low Very low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 100/048

1C. SOLAR COMMENT
No optical correlation for two M2 events. The most likely source
would be the recent flaring region that has just rotated round the
west limb of the sun.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : mailnly quiet to unsettled, with 1
active period

Estimated Indices : A K Observed A Index 28 January
Learmonth 10 3222 4222
Fredericksburg 10 15
Planetary 10 16

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
30 Jan 10 Quiet to unsettled.
31 Jan 10 Quiet to unsettled.
01 Feb 10 Quiet to unsettled.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
29 Jan normal normal normal
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
30 Jan normal normal fair
31 Jan normal normal fair
01 Feb normal normal fair
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were about 15% above predicted monthly values

T index: 82

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
30 Jan 90 About 15% above predicted monthly values.
31 Jan 80 About 15% above predicted monthly values.
01 Feb 80 About 15% above predicted monthly values.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Ionosphere become enhanced during local night.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

161. Daily IPS Report - 31 jan 94

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 02:27:40 UTC
From: dave@eram.esi.com.au
Message-ID: <5158@eram.esi.com.au>
Source record: 28014
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 30 January 1994
Summary for 30 January and Forecast up to 2 February
No warning is current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 099/046

1B. SOLAR FORECAST
31 January 01 February 02 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 105/054

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet to unsettled

Estimated Indices : A K Observed A Index 29 January
Learmonth 10 3222 2233
Fredericksburg 07 07
Planetary 10 08

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
31 Jan 10 Quiet to unsettled.
01 Feb 08 Quiet.
02 Feb 08 Quiet.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
30 Jan normal normal normal
PCA Event : None.

3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
31 Jan normal normal fair
01 Feb normal normal fair
02 Feb normal normal fair
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were mostly 20-35% above monthly predicted values.

T index: 94

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
31 Jan 70 Near predicted to 30% enhanced.
01 Feb 80 Near predicted to 30% enhanced.
02 Feb 80 Near predicted to 30% enhanced.

Predicted Monthly T Index for January is 30.

4C. AUSTRALIAN REGION COMMENT
Sporadic E may affect F layer communications.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

162. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 04:00:05 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_759988805@ve6mgs.ampr.org>
Source record: 28016
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

```
Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
```

a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

--
Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

163. APT-Satellites: Report JAN 29, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 08:44:51 UTC
From: peter.henne@gmd.de
Message-ID: <1994Jan31.084451.19098@gmd.de>
Source record: 28019
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, JAN 29, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)
Meteor 3-5: APT 137.30 OFF ???
Meteor 3-6: APT 137.30 *NEW* ON ??

Meteor 3-5 is over the terminator (more or less), so no
APT could be received at my station.
*NEW* Meteor 3-6 (launched JAN 25) was quiet during orbit #57
around 10.30 UT, transmitted APT during orbit #58 descending
at about 12.20 UT and was quiet again orbit #59 around 14.09 UT.
A gif-image of the europe-pass orbit #58 is available for anon ftp
at ftp.gmd.de, dir images/satellites, file M60129first.gif.
The signal was good but seemed to be somewhat overmodulated.
NOAA-10 is off due to VHF-conflict with NOAA-12, should become
active again FEB 01 6.00 UT due to info from wxsat-mail-list.
And: Meteor 2-21 is weak as always.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53757 St.AUGUSTIN, Germany |
+----------------------------------------+
```

164. APT-Satellites: Report JAN 29, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 10:57:49 UTC
From: peter.henne@gmd.de
Message-ID: <1994Jan31.105749.25009@gmd.de>
Source record: 28015
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SORRY, maybe this is mailed twice:

Observed at station 50.7 NLat, 7.1 ELon, JAN 29, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)
Meteor 3-5: APT 137.30 OFF ???
Meteor 3-6: APT 137.30 *NEW* ON ??

Meteor 3-5 is over the terminator (more or less), so no
APT could be received at my station.
NEW Meteor 3-6 (launched JAN 25) was quiet during orbit #57
around 10.30 UT, transmitted APT during orbit #58 descending
at about 12.20 UT and was quiet again orbit #59 around 14.09 UT.
A gif-image of the europe-pass orbit #58 is available for anon ftp
at ftp.gmd.de, dir images/satellites, file M60129first.gif,
together with a ascii-description named M60129first.txt
The signal was good but seemed to be somewhat overmodulated.
NOAA-10 is off due to VHF-conflict with NOAA-12, should become
active again FEB 01 6.00 UT due to info from wxsat-mail-list.
And: Meteor 2-21 is weak as always.

+--+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53757 St.AUGUSTIN, Germany |
+--+

165. ARLK004 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-01-31 18:17:32 UTC
From: w1aw-list-approval@world.std.com
Message-ID: <$arlk004.1994@ampr.org>
Source record: 28017
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK004
ARLK004 Keplerian data

ZCZC SK71
QST de W1AW
Keplerian Bulletin 4 ARLK004
From ARRL Headquarters
Newington, CT January 29, 1994
To all radio amateurs

SB KEP ARL ARLK004
ARLK004 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94024.05103246 -.00000157 10000-3 0 2553
2 14129 27.1974 345.0665 6022479 148.8987 267.9531 2.05878528 51849
RS-10/11
1 18129U 87054 A 94024.51112470 0.00000029 15038-4 0 8568
2 18129 82.9229 75.0490 0013261 65.1117 295.1421 13.72330004330209
UO-11
1 14781U 84021 B 94027.58994195 0.00000271 53852-4 0 6609
2 14781 97.7910 48.8507 0012401 4.9153 355.2172 14.69129946529662
RS-12/13
1 21089U 91007 A 94027.69685878 0.00000029 14215-4 0 6585
2 21089 82.9228 115.6462 0029982 137.1573 223.1924 13.74033888149355
AO-13
1 19216U 88051 B 94026.63505797 -.00000145 10000-4 0 8695
2 19216 57.8701 271.4247 7210478 333.4771 3.3186 2.09723999 11545
UO-14
1 20437U 90005 B 94028.26890444 0.00000039 32348-4 0 9591
2 20437 98.5965 114.9087 0010274 241.9908 118.0234 14.29819295209591
AO-16
1 20439U 90005 D 94028.25987292 0.00000024 26533-4 0 7603
2 20439 98.6031 115.9878 0010541 243.2967 116.7135 14.29875009209606
DO-17
1 20440U 90005 E 94027.73801710 0.00000039 31945-4 0 7594
2 20440 98.6053 115.7511 0010665 243.9475 116.0601 14.30013086209547
```

```
WO-18
1 20441U 90005 F 94028.27066398 0.00000025 26890-4 0 7600
2 20441 98.6041 116.2877 0011227 243.0969 116.9065 14.29989493209624
LO-19
1 20442U 90005 G 94028.25813267 0.00000042 33233-4 0 7590
2 20442 98.6052 116.4988 0011536 242.1468 117.8543 14.30083361209632
FO-20
1 20480U 90013 C 94027.48250437 -.00000027 20863-4 0 6542
2 20480 99.0158 205.9942 0540414 298.3614 56.4001 12.83223665186087
AO-21
1 21087U 91006 A 94027.61611500 0.00000094 82657-4 0 4197
2 21087 82.9415 246.7308 0036510 114.1293 246.3688 13.74532330150278
UO-22
1 21575U 91050 B 94027.68364431 0.00000060 35027-4 0 4601
2 21575 98.4466 104.9350 0008122 355.6199 4.4915 14.36884969132908
KO-23
1 22077U 92052 B 94027.97690178 -.00000037 10000-3 0 3555
2 22077 66.0832 213.5449 0009026 322.7821 37.2574 12.86283816 68754
KO-25
1 22827U 93061 E 94024.68146431 0.00000048 37106-4 0 3190
2 22827 98.6652 101.8483 0008525 258.2169 101.8056 14.27809123 17216
IO-26
1 22826U 93061 D 94024.19945571 0.00000014 23681-4 0 2574
2 22826 98.6696 101.3894 0008709 274.0164 86.0022 14.27705052 17144
AO-27
1 22825U 93061 C 94024.20805866 0.00000024 27909-4 0 2564
2 22825 98.6679 101.3787 0008002 272.5619 87.4646 14.27602782 17142
PoSat
1 22829U 93061 G 94028.23890898 0.00000042 34883-4 0 2507
2 22829 98.6603 105.3994 0009389 246.0309 113.9887 14.27999663 17721
Arsene
1 22654U 93031 B 93361.28113215 -.00000051 10000-3 0 2117
2 22654 1.4185 112.4561 2935300 163.8590 194.2493 1.42195961 3311
STS-60
1 99960U 94034.56756353 0.00033606 55816-4 0 46
2 99960 57.0033 215.8607 0010675 264.1500 95.8328 15.72291901 23
Mir
1 16609U 86017 A 94027.71283080 0.00010322 13245-3 0 1150
2 16609 51.6150 171.3210 0004383 242.7692 117.2855 15.59769565454131

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
February 1, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

166. Mods to 9600 for IC-970

Newsgroup: rec.radio.amateur.space
Date: 1994-02-01 09:30:01 UTC
From: mkl@uwasa.fi
Message-ID: <2il7ep$lpc@zippo.uwasa.fi>
Source record: 28020

I have tried to locate some documents on how to modify my IC-970
to do 9600 bps for satelite use. Could someone mail it, or tell,
me where I could ftp it from?

While I'm at it, has anyone interfaced Trackbox with IC-970? Do
you use the IC-970 serial interface to track dopler shift? If so
should I use RS-232 or TTL signals to talk with my rig?

--
Markus

167. Daily IPS Report - 1 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-01 22:52:49 UTC
From: dave@eram.esi.com.au
Message-ID: <5160@eram.esi.com.au>
Source record: 28021
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 31 January 1994
Summary for 31 January and Forecast up to 3 February
No warning is current.

1A. SOLAR SUMMARY
Activity: Very Low

Flares: None

Observed 10.7 cm flux/Equivalent Sunspot Number : 098/045

1B. SOLAR FORECAST
01 February 02 February 03 February
Activity Low Low Low
Fadeouts None Expected None Expected None Expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 100/048

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : Quiet

Estimated Indices : A K Observed A Index 30 January
Learmonth 07 2222 2222
Fredericksburg 07 09
Planetary 08 09

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
01 Feb 08 Quiet
02 Feb 05 Quiet
03 Feb 05 Quiet

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
31 Jan normal normal normal
PCA Event : None.

3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
01 Feb Normal Normal Fair
02 Feb Normal Normal Normal
03 Feb Normal Normal Normal
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were mostly 15-30% above monthly predicted values.

T index: 82

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
01 Feb 70 Near predicted to 30% enhanced
02 Feb 70 Near predicted to 30% enhanced
03 Feb 70 Near predicted to 30% enhanced

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Sporadic E may affect F layer communications at times.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

168. Daily IPS Report - 2 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-01 23:22:51 UTC
From: dave@eram.esi.com.au
Message-ID: <5161@eram.esi.com.au>
Source record: 28022
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 1 February 1994
Summary for 1 February and Forecast up to 4 February
No warning is current.

1A. SOLAR SUMMARY
Activity: Very low

Flares: None.

Observed 10.7 cm flux/Equivalent Sunspot Number : 094/040

1B. SOLAR FORECAST
02 February 03 February 04 February
Activity Very low Very low Very low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 090/034

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet

Estimated Indices : A K Observed A Index 31 January
Learmonth 06 2222 2212
Fredericksburg 07 08
Planetary 08 07

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
02 Feb 05 Quiet.
03 Feb 05 Quiet.
04 Feb 05 Quiet.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
01 Feb normal normal normal
PCA Event : None.

3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
02 Feb normal normal normal
03 Feb normal normal normal
04 Feb normal normal normal
3C. GLOBAL HF PROPAGATION COMMENT
Sporadic E may affect F layer communications at middle latitudes.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted February values until 09UT, then
15-30% enhanced. Sporadic E may have affected F layer communications
around 17 and 18UT.

T index: 61

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
02 Feb 70 Near predicted to 30% enhanced.
03 Feb 70 Near predicted to 30% enhanced.
04 Feb 70 Near predicted to 30% enhanced.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
F layer communications may be affected by sporadic E at times.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

169. AMSAT News Service Buiil 028

Newsgroup: rec.radio.amateur.space
Date: 1994-02-02 11:52:19 UTC
From: marcbg@netcom.com
Message-ID: <$arla028.1994@ampr.org>
Source record: 28027
Cross-posted to: rec.radio.info,sbay.hams,rec.radio.amateur.space

#: 237170 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:00:31
Sb: AMSAT: DOVE Telemetry
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.01 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.01

DOVE (DO-17) Telemetry Watchers Will Be Recognized

This weekend the DOVE (DO-17) Command Team will begin using the DOVE text message frame to transmit the callsigns of everyone who has sent a DOVE reception report to Dr. Junior Torres De Castro (PY2BJO) of the Brazilian AMSAT Group, BRAMSAT, the owner of DOVE. Because of the limited length of that frame, about 15 calls will be sent at a time and the message will be changed about every 3 or 4 days. This is the DOVE Ground Command Team's way of thanking everyone who has sent in reports (several hundred at present). Special DOVE QSL cards will also be mailed to those who have reported DOVE reception to PY2BJO. We are particularly interested in hearing about the equipment used and the quality of the signals. We would also like to hear about the use of DOVE signals or data in education. Actual telemetry is not needed at this time.

Please send reports to:

Dr. Junior Torres De Castro (PY2BJO)
119 Macaubal
Sao Palo
Brazil 01254

[The AMSAT News Service would like to thank Jim White (WD0E) and the DOVE Command Team for this bulletin item.]

#: 237171 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:00:41
Sb: AMSAT: Antenna Polar...
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.02 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.02

Antenna Polarization Sense Revisited By WD0E

There have been many discussions occurring on Compuserve's HAMNET forum and in various corners of the amateur radio community about the need for antenna polarity switching while using the OSCAR satellites. DOVE Command Team member Jim White (WD0E) wants to add some futher comments about this important issue based on his years of experience working with the MICROSATs.

Case For Polarization Switching

"The following is based on design data, direct measurements and experimentation, surveys, and anecdotal evidence from discussion threads on the digital birds and Compuserve. I believe the empirical data is correct, but an error or two could certainly have crept in. I submit it for discussion and comment. The sense (right or left) of the circular polarization of the four original MICROSATs changes depending on the transmitter in use. There was no attempt to make a particular transmitter any sense. The way they came out was based on how the semi-rigid cable and components could be designed into the transmitter module. Here is a list of the sense of each one:

AO-16 RC 437.050 RHCP
AO-16 PSK 437.025 LHCP
DO-17 XMTR A 145.825 LHCP
DO-17 XMTR B 145.825 RHCP
WO-18 RC 437.100 RHCP
WO-18 PSK 437.075
LO-19 RC (&CW) 437.125 RHCP
LO-19 PSK 437.050 LHCP

The AO-16 PSK XMTR and the WO-18 PSK XMTR have problems and are not presently in use (although the AO-16 PSK transmitter - with LHCP - was used for about three years). We normally run XMTR B on DOVE because it is slightly more efficient. Last time I checked LO-19 was being switched occasionally between it's two. So it is strictly coincidence that three of these are RHCP virtually all the time. LO-19 changes. Problems with any of the xmtrs presently in use could result in a switch, which would change their downlinks to LHCP.

As long as you are receiving strong signals from these satellites, a miss-matched sense will not reduce the margin enough to cause missed data. However, if the signal is weak, because of a marginal receive arrangement or low power from the satellite, a miss-matched sense will cause significant loss of data. Uplinks are not a problem because they use monopoles and the receivers are very sensitive.

FO-20 is circular and has a fixed sense both up and down, but because of it's orbit geometry and motion, continuously good signals through it for an entire pass can only maintained if sense is switched, usually several times and on both uplink and downlink. This is particularly noticeable in the analog mode.

On AO-21, the 435 MHz receiving antenna, which is shared by the analog and

digital modes, is a Helix with up to +3 db gain using Right Hand Circular Polarization. The 145 MHz transmitting antenna is a half-wave dipole. These antennas are always earth-pointing due to the satellite's gravity gradient attitude stabilization system. It is clear from a little experimentation and from listening to the DSP FM repeat mode, that changing sense
makes a significant difference in the overall link. At times, it is the difference between being heard and not. It changes during a pass. The UOSAT series use monopole antennas. I have never noticed a difference in link efficiency when sense is switched.

I have no data on which AO-26 transmitter has which sense. But this is a MICROSAT design, so changing transmitters will change sense. In it's first weeks of store and forward operation it was running very low power and incorrect sense made a large difference in received strength during most parts of most passes. If it continues to be necessary to run low power from this satellite, or if the LHCP transmitter is used, left hand sense will be necessary, and switching during a pass may be essential for efficient operation.

AO-27 (EYESAT) uses a monopole for the downlink so sense makes little difference when the amateur transmitter is on high power. However, when receiving very weak signals from it (exciter only), switching sense is necessary to be able to even detect the signal at times. It remains to be seen how much power this bird will be able to sustain on it's amateur (secondary) transmitter, so downlink sense could be an issue. Uplink is not an issue, as a monopole is used with very sensitive receivers.

UNAMSAT is built on a MICROSAT design. It's downlink sense may be left or right depending on which transmitter is used. Downlink power and sense will not be known until this bird is in orbit and becomes operational. During checkout it is likely both transmitters will be used at times, requiring sense switching. Tumbling during the first few days in orbit will almost certainly require switching. Downlink power *could* be somewhat lower than AO-16 and LO-19 because of the power necessary to run the meteor experiment transmitter. This situation would be similar to WO-18, which routinely runs at about half of the power of AO-16 and LO-19 because of the need to support the experiments.

VOXSAT will use monopole antennas, so the link polarization and sense needs may be similar to AO-21.

AO-13: Gain antennas are RHCP. When the satellite is at or near apogee and/or pointing angles are good, RHCP is always best. However, when there is significant off pointing or the omni's are in use, LHCP can often result in better uplink and downlink signals. LHCP can be better both in terms of more strength and reduced depth of spin modulation fade.

Stan Wood (WA4NFY) informs me that Phase-3D will use all RHCP for its circular antennas. Since it will be nadir pointing at all times, sense switching should not be necessary. This assumes all goes as planned, and we certainly hope it does!

I may have left out a bird or two, and have not hit all those being planned. Nor have I attempted to exhaustively document all situations or those of interest only to command stations. However, there are numerous situations in the foregoing where LHCP is necessary or favored. Using the wrong sense will reduce efficiency and/or enjoyment. In a few cases it may make operation impossible. There is certainly much enjoyment available to a satellite enthusiast with fixed RHCP antennas (or even linear). But I hope I have shown that full utilization of our satellite resources requires switchable antenna circularity."

[The AMSAT News Service (ANS) would like to thank Jim White (WD0E) for this bulletin. If you would like to respond to Jim's thoughts on antenna polarization, he can be reached at his INTERNET address of: wd0e@amsat.org.

Also, the ANS would like to thank DB2OS for the information about the AO-21

antennas.]

#: 237172 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:00:47
Sb: AMSAT: Phase 3-D Team
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.03 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.03

AMSAT-NA PHASE 3-D TEAM JOINS WITH FLORIDA-BASED ENGINEERING GROUP FOR SPACECRAFT INTEGRATION

About a half dozen members of the North American Phase 3-D Development team met recently to assess overall progress on the program and to begin planning for the spacecraft's final assembly in preparation for its April, 1996 launch from Korou, French Guyana.

Dick Jansson (WD4FAB), AMSAT VP for Engineering, hosted the North American Phase 3-D progress meeting near Orlando, Florida on 7-9 January, 1994, where a number of critical Phase 3-D issues were discussed. While several open items still must be resolved, AMSAT-NA's overall technical contributions to the Phase 3-D project remain on track.

"We're still on schedule for the 1996 launch," said Bill Tynan (W3XO), AMSAT-NA President. "I am really proud of the way everyone on the North American team is pulling together to insure our responsibilites to the international project are met", he said.

The high point of the meeting came when several officers of a Florida-based volunteer group, called Space Frontier Operations (SFO), presented their proposal to manage the overall integration effort for the Phase 3-D spacecraft. After extensive discussions concerning their capabilities and proposed integration approach, SFO's offer was greatfully accepted by Bill Tynan, Dick Jansson, and the rest of AMSAT-NA Phase 3-D team members

present.

Space Frontier Operations is a relatively new group based in the Orlando/Cape Canaveral, Florida area. Presently, their membership stands at about one hundred. They are, however, a rapidly growing, not-for-profit, Florida corporation dedicated to the private, non-commercial, use of space. Their first project was a "Get-Away Special" (GAS Can) experiment which will fly on an upcoming NASA Space Shuttle mission. Most SFO members are also connected professionally to NASA or other space agencies at the Cape. Together, they bring several decades of "hands on" experience designing and building a wide variety of government and commercial space hardware to the Phase 3-D integration effort.

"We are very honored to be associated with such a prestigious group as AMSAT", said Andy Clark, SFO's Chief Executive Officer at the recent Orlando meeting. He went on to note, "We believe our professional aerospace experience will bring another, very positive dimension to an already outstanding international Phase 3-D team." These same feelings were echoed by Mike Peacock (KR4GA), SFO's Director of Engineering, who stated that because SFO and AMSAT share many of the same goals, the partnership should prove mutually benefical.

Also on hand for the meeting were Keith Baker (KB1SF), AMSAT VP, Strategic Planning, who discussed the overall Phase 3-D Master Schedule. In addition, Stan Wood (WA4NFY), udpated the team on Phase 3-D's various antenna designs. Dick Daniels (W4PUJ), AMSAT's North American P3-D Team Director along with Dr. Tom Clark (W3IWI), P-3D GPS experiment Team Leader, joined the group by telephone. Longtime AMSAT satellite builder Jan King, W3GEY, and Lyle Johnson (WA7GXD), from TAPR, were also present and served as technical advisors to both teams during the discussions.

Final designs for solar cells, solar panels, batteries, as well as the progress now being made on the spacecraft's overall structure were also discussed. In addition, possible integration sites in the Orlando/Cape Canaveral area were evaluated and several team members toured a candidate facility at the Orlando International Airport. A final selection regarding the most cost-effective location for Phase 3-D integration will be made once firm rental price proposals are received and evaluated by the now AMSAT-NA/SFO combined Phase 3-D integration team.

[The AMSAT News Service would like to thank Keith Baker (KB1SF) for this bulletin item. Keith can be reached at his Compuserve address of 75070,331.]

#: 237173 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:00:58
Sb: AMSAT: Ops Net Schedule
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.05 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994

TO ALL RADIO AMATEURS BT
BID: $ANS-028.05

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

06-Feb-94 0530 B 057 W5IU WA5ZIB
12-Feb-94 2200 B 063 W9ODI VE2LVC
20-Feb-94 0200 B 070 WA5ZIB W5IU
28-Feb-94 0430 B 068 WB6LLO W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

#: 237174 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:01:10
Sb: AMSAT: KO-25 BBS Service
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.06 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.06

KITSAT-OSCAR-25 Begins Bulletin Board Operations (BBS) 01-FEB-94

KO-25 will open its BBS service beginning on 01-FEB-94. Many discussions are going on about KO-25 services. Thank you for your cooperation so far by keeping your transmitters silent on the KO-25 uplink frequencies so that we could complete our experiments with KO-25. KO-25 will operate in normal mode, 9600 baud FSK using the usual set-up for any of the 9600 baud OSCARS, e.g., KO-23, UO-22, or PoSAT. You will, therefore, not have to make any changes to your station to use KO-25.

Since not all the on board experiments are not finished yet on KO-25, there will be, at times some interruptions of service. But, SaTReC has decided to open the service because the remaining experiments will not cause any serious problems with the KO-25 BBS service.

"We hope you enjoy our new star in space," says Hyungshin Kim of the Korean Institute of Advanced Space Technology.

#: 237175 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:01:15
Sb: AMSAT: AO-13 ZRO Test
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.07 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.07

AO-13 ZRO Tests Begin For '94

AMSAT-OSCAR-13

ZRO TEST SCHEDULE

FEBRUARY-MARCH 1994

The ZRO Memorial Technical Achievement Award Program, or just "ZRO Test" has a

new schedule for February and March, 1994, via AMSAT-OSCAR-13. This activity

is a test of operating skill and equipment performance.

During a typical ZRO run, a control station will send numeric code groups using
CW at 10 words-per-minute. At the beginning of the run, uplink power from the

control station is set to match the general beacon downlink strength. This is

level "zero". The control operator will send and repeat a random five-digit number, then lower his uplink power by 3 dB (half power) and repeat the procedure with a new random number (level "1"). This will continue to a level

30 dB below the beacon (level "A").

A participating listener monitors the downlink signals until he or she can no

longer copy the numbers. Those who can hear the beacon will qualify for the basic award by copying the code group heard at level "zero". The challenge is

to improve home-station performance to a point where the lower-level downlink

signals can be copied (levels 6 through A). To date, only one station, Darrel

Emerson (AA7FV), has successfully copied level "A".

The following schedule of Mode "B" tests were chosen for convenient operating

times and favorable squint angles. The tests can be heard on 145.840 MHz. Andy WA5ZIB will conduct all the tests. Mode "JL" tests will no longer occur

due to the failure of AO-13's 70-cm transmitter.

Day Date (UTC) Time Areas covered

Saturday Feb. 12, 1994 2345 UTC NA, SA, Europe, W. Africa
Sunday Feb. 20, 1994 0330 UTC NA, NW SA, Japan, Pacific
Saturday Feb. 26, 1994 1930 UTC NA, SA, Europe, Africa, ME
Saturday Mar. 19, 1994 1930 UTC NA, SA, Europe, Africa
Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC", thus the second test occurs at
9:30 PM CST Saturday night (the 19th). Any changes will be announced as soon

as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy MacAllister WA5ZIB, AMSAT V.P. User Operations, 14714 Knights Way Drive,

Houston, TX 77083-5640. A report will be returned verifying the level of accurate reception. An S.A.S.E. is appreciated but not required.

Information about the AMSAT Awards Program can be found on page 197 of the "Proceedings of the AMSAT-NA Tenth Space Symposium" (1992). This paper, covering all the AMSAT-NA awards including specifics on the ZRO Test, was reprinted on page 10 in the March/April 1993 issue of "The AMSAT Journal". The ZRO Test information provided in the article covers test procedures, means
for obtaining certificates and gives some historical background about the pro-
gram. Reprints of the article can be obtained for an S.A.S.E. to WA5ZIB at the address above.

#: 237176 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:01:18
Sb: AMSAT: AO-21 Birthday
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.08 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.08

Happy Birthday AMSAT-OSCAR-21!

On 29-JAN-91 the first international Orbiting Satellite Carrying Amateur Radio

(OSCAR) in which radio amateurs from the former Soviet Union (CIS) worked together with radio amateurs from Germany was successfully launched.

The official name of the project was RM1, which stands for "RADIO M-1". The digital transponder RUDAK-2 is part of RM1.

After the launch from the Northern Cosmodrome in Plesetsk, Russia, the satellite
was named as AMSAT-OSCAR-21, to emphasize that the spacecraft was built by, and for, Radio Amateurs around the world.

AMSAT OSCAR-21 was attached as a secondary payload (Piggy-back) aboard the CIS

geological research satellite "INFORMATOR-1".

AMSAT-OSCAR-21 (also known as RS-14) is a joint project between AMSAT-U in Russia and AMSAT-DL in Germany.

[The AMSAT News Service (ANS) would like to thank DB2OS for this bulletin item.]

#: 237177 S5/Amateur Satellites [HAMNET]
30-Jan-94 19:01:22
Sb: AMSAT:Weekly Status Rpts
Fm: HamNet SysOp Scott W3VS 76703,407
To: All

HR AMSAT NEWS SERVICE BULLETIN 028.09 FROM AMSAT HQ
SILVER SPRING, MD JANUARY 29, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-028.09

Weekly OSCAR Status Reports: 29-JAN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jan 31-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
Poor Sun angle and battery testing need maximum OFF time.
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current FO-20 operating schedule:
From January '94 thru March '94, the analog mode and the
digital mode will be on alternately for a week at a time.
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-21: ZL3VTV works AO-21 with great success from his QTH in Christchurch, New
Zealand. He reguarly works stations in Australia with ease using a
a fixed 10 element beam pointed 30 deg above the horizon on the uplink

and using a collinear antenna for the downlink. ZL3VTV is looking for
to work more ZL's and would entertain schedules. [ZL3VTV @ZL3AC]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current
set of orbital elements are not generating the correct AOS/LOS times at
your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you
provide will be of value to all OSCAR enthusiasts.
--
Marc B. Grant fax 214-231-3998 voice 214-246-1150
marcbg@netcom.com Amateur Radio N5MEI
marcbg@esy.com Richardson, TX

170. Shutle Freqs?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-02 22:06:31 UTC
From: ez006683@chip.ucdavis.edu
Message-ID: <CKMAqx.5Gy@ucdavis.edu>
Source record: 28023

I KNOW this is a faq but....

What are the STS-60 FREQS? I would like both Government and Sarex freqs.

Thanks,
Dan

--
---
* Daniel D. Todd Packet: KC6UUD@KE6LW.#nocal.ca.usa *
* Internet: ddtodd@ucdavis.edu *
* Snail Mail: 1750 Hanover #102 *
* Davis CA 95616 *
---
* I do not speak for the University of California.... *
* and it sure as hell doesn't speak for me!! *
---

171. Re: * SpaceNews 31-Jan-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-02-03 04:22:25 UTC
From: Dave <hartrum@delphi.com>
Message-ID: <19940202.23222507.hartrum@delphi.com>
Source record: 28024

Is it just me or does it seem that the 1/31/94 issue of spacenews was cut
short???
If anyone could post the full text of the issue I would appreciate it!!

172. Re: Anik Satellite Troubles

Newsgroup: rec.radio.amateur.space
Date: 1994-02-03 04:22:33 UTC
From: ao601@FreeNet.Carleton.CA
Message-ID: <CKMs5L.GKA@freenet.carleton.ca>
Source record: 28025

Latest news on the Anik sat. from Ottawa local news is that the problem has been narrowed down to the bird rotating about it's n/s axis once every 2 minutes. The good folks at telsat report that they believe it's possible to stop the motion and keep the ant. pointed at earth by ground controlled firing of the onboard hydrazine rockets. In the event this works it will allow a return to revenue service in about 6 months. I understand this is a massive software task and the knowledge gained is expected to generate a large cash-flow in the future in the event of a similar failure of someone else's bird. The down side of this is that the life expectancy of this relatively new satellite has just gone from 9 to 6 years. On the bright side the Canadian amateur radio country wide uhf link "I.P.A.R.N." has had it's anik channel moved to Anik-2 in only 5 working days, a fine job and many thanks from the Canadian hams.

Hope this is news
Rick

173. Inexpensive GPS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-03 08:30:37 UTC
From: shdomaji@kuhub.cc.ukans.edu
Message-ID: <1994Feb3.023037.58100@kuhub.cc.ukans.edu>
Source record: 28026

I have been intrested in global positioning. I have seen units for under $600, and pc interface and logging is available. Do the makers of these units pay for the service of the satalites. (Can these signals be received with pc software and receiver or receivers and used for global positioning.) Do GPS units have multiple receivers {3}, or a single receiver that receives timed signals from multiple satalites. I would appreciate any info or source of info on this subject. Or a site that has GPS software.
Thanx$$$

174. STS-60 Shuttle Ground Communications Retransmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-02-03 17:12:00 UTC
From: stocker@nssdca.gsfc.nasa.gov
Message-ID: <3FEB199413121773@nssdca.gsfc.nasa.gov>
Source record: 28028

INTERESTED IN THE CURRENT SHUTTLE MISSION
The current mission has a number of interesting aspects: this first Russian astronaut to fly on a shuttle, the 100th GSFC managed Get Away Special payload, as well as planned Shuttle Amateur Radio Experiment activities.

The Goddard Amateur Radio Club (GARC) WA3NAN invites you to tune into Shuttle transmissions. As a public service to the Amateur radio community, the GARC retransmits space shuttle air-to-ground communications. During the STS-60 mission, Amateur radio operators, shortwave listeners, and those individuals with scanners can listen to these communications on the following frequencies:

3.860 MHz (lower sideband)
7.185 MHz (lower sideband)
14.295 MHz (upper sideband)
21.395 Mhz (upper sideband)
28.650 Mhz (upper sideband)

and

147.45 Mhz (FM)

Erich, N3OXM
GARC PI Coordinator

175. Daily IPS Report - 4 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-03 23:43:47 UTC
From: dave@eram.esi.com.au
Message-ID: <5166@eram.esi.com.au>
Source record: 28029
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 3 February 1994
Summary for 3 February and Forecast up to 6 February
IPS Warning 3 was issued on 3 Jan and is current for 7-11 Feb.

1A. SOLAR SUMMARY
Activity: low

Flares: None.

Observed 10.7 cm flux/Equivalent Sunspot Number : 98/46

1B. SOLAR FORECAST
04 February 05 February 06 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 100/49

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : mostly quiet with unsettled to
active conditions 12-21UT

Estimated Indices : A K Observed A Index 2 February
Learmonth 09 0122 3431
Fredericksburg 10 14
Planetary 10 15

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
04 Feb 10 Quiet to unsettled.
05 Feb 08 Quiet.
06 Feb 07 Quiet.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
03 Feb normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
04 Feb normal normal fair
05 Feb normal normal fair
06 Feb normal normal normal
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values to 30% enhanced
during local night.

T index: 55

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
04 Feb 55 Near predicted monthly values to 15% enhanced.
05 Feb 50 About 10% above predicted monthly values.
06 Feb 50 About 10% above predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

176. Weekly IPS Report - 4 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-04 00:15:54 UTC
From: dave@eram.esi.com.au
Message-ID: <5167@eram.esi.com.au>
Source record: 28030
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

28 JANUARY - 3 FEBRUARY 1994

Issue No 05
Date of issue: 4 February, 1994

INDICES:
Date 28 29 30 31 01 02 03
10cm 119 102 099 098 094 096 098
A 15 07 09 08 06 15 (10)
T 41 82 94 82 61 76 55

SUMMARY OF ACTIVITY

January 28
Solar activity was moderate, with an M1/SF at 1704UT, and an M1 at
1852UT.
The geomagnetic field at Learmonth (WA) was quiet to unsettled
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values

January 29
Solar activity was moderate, with an M2 at 0413UT, and an M2 at
1129UT.
The geomagnetic field at Learmonth (WA) was mailnly quiet to
unsettled, with 1 active period
Ionospheric F2 critical frequencies at Sydney were about 15% above
predicted monthly values

January 30
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was quiet to unsettled
Ionospheric F2 critical frequencies at Sydney were mostly 20-35%
above monthly predicted values.

January 31
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was quiet
Ionospheric F2 critical frequencies at Sydney were above 20-30%
above predicted monthly values.

.SK
February 1
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was quiet
Ionospheric F2 critical frequencies at Sydney were near predicted
February values until 09UT, then 15-30% enhanced. Sporadic E may have

affected F layer communications around 17 and 18UT.

February 2
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was quiet to unsettled
Ionospheric F2 critical frequencies at Sydney were 15 to 30% above
predicted monthly values

February 3
Solar activity was low.
The geomagnetic field at Learmonth (WA) was mostly quiet with
unsettled to active conditions 12-21UT
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values to 30% enhanced during local night.

FORECAST FOR THE NEXT WEEK (4 - 10 FEBRUARY)

SOLAR: low

GEOMAGNETIC: 4-6 Feb quiet to unsettled and an active period is
expected for the 7-11 Feb.

IONOSPHERIC: Near predicted levels to 20% above, then about 15%
below precdicted monthly levels from the 7th-11th Feb.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

177. Re: Inexpensive GPS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-04 05:56:10 UTC
From: mfraser@vanbc.wimsey.com
Message-ID: <2iso1q$oa8@vanbc.wimsey.com>
Source record: 28031

If you call West Marine at any of their Seattlelocations you can
probably get one of two "brand" name handheld gps, multi-channel
units for $449.00. These give location, elevation, direction and speed
of travel, and bounce quite well. I really don't think you
will do much better than that, since the OEM units are priced to
discourage amateur players like us. They offer less, need more external
support (antennas, software and a laptop or better), but cost more.

Good luck / Mark

178. Re: Inexpensive GPS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-04 16:35:21 UTC
From: wrm@friskie.WPI.EDU
Message-ID: <2ittg9$peq@bigboote.WPI.EDU>
Source record: 28032

>I have been intrested in global positioning. I have seen units for under
>$600, and pc interface and logging is available. Do the makers of these units
>pay for the service of the satalites. (Can these signals be received with
>pc software and receiver or receivers and used for global positioning.)

The cost of the GPS system is paid by all of us through the budget of the
Department of Defense. DoD maintains the satellites and makes navigation
available to the civil community. Who will pay for GPS in the future is
a politically charged, emmotional issue with international implications.
As the system now stands, civil users may purchase receivers that are able
to receive GPS signals that are capable of providing 100 meter accuracy
in 2 dimensions. (Indeed, it's possible to improve this accuracy by
orders of magnitude, but not at the $600 level).

> Do GPS units have multiple receivers {3}, or a single receiver that
>receives timed signals from multiple satalites. I would appreciate any info or
>source of info on this subject. Or a site that has GPS software.

Most inexpensive receivers have a single L-band receiver that receives
range, time, and ephemeral information the satellites (the ephemerides and
time provide a (semi) known satellite location). More expensive receivers
will receive both the L1 and L2 signals transmitted from GPS and can more
accurately account for effects such as ionoshperic delay.

There is also a system called GLONASS which is the Russian version of GPS.

>Thanx$$$

No problem.

Bill Michalson
Satellite Navigation Research Group
Department of Electrical and Computer Engineering
Worcester Polytechnic Institute
Worcester, MA 10609

179. Re: STS-60 / SAREX Freqs?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-04 22:50:08 UTC
From: ez006683@chip.ucdavis.edu
Message-ID: <CKq23L.GFz@ucdavis.edu>
Source record: 28033

Bill VanRemmen (BILLY@urhep.pas.rochester.edu) wrote:

: Could someone please post the SAREX Freqs? Is it on 145.55? Somewhere else?

Voice downlink: 145.55 MHz
Voice uplink: 144.91Mhz .93 .95 .97 144.99MHz
Packet Downlink:145.55MHz
Packet uplink: 144.49MHz

cheers,
Dan
--
---
* Daniel D. Todd |Packet: KC6UUD@wKE6LW.#nocal.ca.usa *
* Internet: ddtodd@ucdavis.|edu *
* Snail Mail: 1750 Hanover #102 *
* Davis CA 95616 *
---
* I do not speak for the University of California.... *
* and it sure as hell doesn't speak for me!! *
---

180. Daily IPS Report - 5 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-05 00:02:10 UTC
From: dave@eram.esi.com.au
Message-ID: <5168@eram.esi.com.au>
Source record: 28034
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 4 February 1994
Summary for 4 February and Forecast up to 7 February
IPS Warning 03 was issued on 3 Feb and is current for 7-11 Feb.

1A. SOLAR SUMMARY
Activity: very low

Flares: None.

Observed 10.7 cm flux/Equivalent Sunspot Number : 095/043

1B. SOLAR FORECAST
05 February 06 February 07 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 095/043

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : mostly quiet with unsettled to
active conditions 12-21UT

Estimated Indices : A K Observed A Index 3 February
Learmonth 10 3111 3431
Fredericksburg 08 10
Planetary 08 10

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
05 Feb 07 Quiet to unsettled.
06 Feb 07 Quiet to unsettled.
07 Feb 17 Active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
04 Feb normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
05 Feb normal normal normal
06 Feb normal normal normal
07 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values to 15% enhanced
during local night.

T index: 43

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
05 Feb 35 Near predicted monthly values.
06 Feb 30 Near predicted monthly values.
07 Feb 0 About 20% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

181. RS-14?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-05 14:16:28 UTC
From: bargholzg@vms.csd.mu.edu
Message-ID: <00979988.29C9C4C0@vms.csd.mu.edu>
Source record: 28042

I heard a cw beacon on 145.820. IDing itself as RS14.
Anyone have a Norad number on this, or another name?
Can't find RS14 in the standard Kelp set.

Please Mail direct:
in%"bargholzg@vms.csd.mu.edu"

Thanks, 73 N9UUR Gary

182. Re: Inexpensive GPS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-05 17:16:00 UTC
From: zeus@myth.demon.co.uk
Message-ID: <760468560snz@myth.demon.co.uk>
Source record: 28035

In article <4FEB199411293694@zeus.tamu.edu>
tskloss@zeus.tamu.edu "SKLOSS, TIMOTHY WILLIAM" writes:

> In article <1994Feb3.023037.58100@kuhub.cc.ukans.edu>,
> shdomaji@kuhub.cc.ukans.edu writes...
> >I have been intrested in global positioning. I have seen units for under
> >$600, and pc interface and logging is available. Do the makers of these units
> >pay for the service of the satalites. (Can these signals be received with
> >pc software and receiver or receivers and used for global positioning.)

It is free. The U.S. taxpayer funds it (aren't they nice).

>
> Well, forget making a GPS receiver yourself unless you can get a
> GPS chip from Motorola ($35). The nature of the signals demands very high
> timing resolution, so high that it requires specially built components. Most
> of which (i think) are incorporated in the Motorola chip. This chip, by the
> way, is the heart of almost all GPS receivers on the current market.
>

Bilgewater. Sorry Tim, this isn't a flame, honestly. GEC/Plessey produce
a GP1010 / GP1020 chipset which looks like costing about 100 / pair in
quantity, but it is much better than the Motorola (I think?). The GP1010
converts the 1.5 Gigs signal down to a lower frequency digitized version. The
GP1020 has 6 digital 'receivers' (correlators, sometimes implemented in
software). A lot of manufacturers use their own system, Transputers / custom
hardware etc. Time resolution is no problem. The chipset is adjustable and
can be calibrated by it's driver software if enough sats are in view. Time is
just another dimension like x,y,z (lat, long, height).

> My advice is to wait. GPS prices have already halved in the last two years
> and the interfaces (the most important part in my opinion) just keep on
> getting better. It will soon be like cellular telephones: the whole phone
> on one chip with a few RF pieces; but you won't have to pay for the service.
> Since cars already have GPS's as standard equipment (on some models), you
> will see the prices fall even more.
>
> -tim
>

GPSs are already on a 2 piece chipset + processor. The Iridium system
will have GPS receivers built in. I reckon on about $10 for a chipset by 2000.
Easily.

--

Michael S. Cowgill (Mike) _ My opinions! MINEMINEALLMINEHAHAHAHA!
zeus@myth.demon.com (That's me) _ #include <witticism.h> or if #undef
G1VOX@GB7WRG.GBR.EU 44.131.2.76 _ " ...Cracking toast Grommit!... "

183. Connect callsign for the Shuttle?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-05 19:58:55 UTC
From: "Eleen N. Kamas" <kamas+@CMU.EDU>
Message-ID: <IhIzdzm00WBM43cn9K@andrew.cmu.edu>
Source record: 28043
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.misc

Hi All!

Well, I managed to hear the shuttle's packet radio this morning, but I have no Idea what call sign to connect to. Or for that matter what is the procedure once you do connect. Could someone give a brief tour of connecting to the Shuttle and getting a QSL card?

Also, can I recieve the equivalent of a QSL card for just hearing them?

Chuck Kamas
N3QAT
ee2g+Charles@andrew.cmu.edu

Eleen N. Kamas
kamas+@cmu.edu

184. SAREX Update 2/6 at 00:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 00:50:37 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-60.007.1994@ampr.org>
Source record: 28044
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-60.007
SAREX Update 2/6 at 00:30 UTC

SAREX was officially activated at 14:27 UTC on February 4 with a successful voice contact through the University of Surrey amateur radio station. Doug Loughmiller, G0SYX was the operator at the microphone to intitate the first contact with the STS-60 crew.

The SAREX team reports a highly successful direct contact one orbit later with a school group in Boise Idaho. The contact, held at the Discovery Center included students from several schools including the Boise Senior High School. 19 students were able to ask direct questions to Shuttle Commander Charlie Bolden.

The packet robot has also been quite active. The packet QSO sequence number exceeded the 800 mark about 30 hours after SAREX operations was initiated.

Problems with RFI on the Wake Shield Facility have delayed the deployment of this primary payload. This has affected the SAREX payload somewhat. Currently, the Mars, Pennsylvania school contact, which was scheduled for today, has been postponed until the Wake Shield issues have been resolved.

The official SAREX element set for today will be GSFC-003. Gil Carman, WA5NOM reports that the predictions using GSFC-003 are 1 second later than the current orbiter state vector.

1 22977U 94006A 94 35.13981770 0.00000202 00000-0 58718-5 0 37
2 22977 56.9857 213.2731 0008535 263.0773 96.9324 15.72145611 115

Satellite: STS-60
Catalog number: 22977
Epoch time: 94035.13981770 (04 FEB 94 03:21:20.25 UTC)
Element set: GSFC-003
Inclination: 56.9857 deg
RA of node: 213.2731 deg Space Shuttle Flight STS-60
Eccentricity: 0.0008535 Keplerian Elements
Arg of perigee: 263.0773 deg
Mean anomaly: 96.9324 deg
Mean motion: 15.72145611 rev/day Semi-major Axis: 6730.8981 Km
Decay rate: 0.20E-05 rev/day*2 Apogee Alt: 358.25 Km
Epoch rev: 11 Perigee Alt: 346.77 Km

NOTE - This element set is based on NORAD element set # 003.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it

into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

185. ANS Bulletin 036.06

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 05:54:56 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-036.06.1994@ampr.org>
Source record: 28036
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-036.06
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 036.06 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-036.06

Weekly OSCAR Status Reports: 6 FEB-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jan 31-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
Poor Sun angle and battery testing need maximum OFF time.
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current FO-20 operating schedule:
From January '94 thru March '94, the analog mode and the
digital mode will be on alternately for a week at a time.
ANALOG MODE:
09-FEB-94 7:15 -TO- 16-FEB-94 7:40 UTC
23-FEB-94 8:05 -TO- 02-MAR-94 6:40 UTC
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-21: ZL3VTV works AO-21 with great success from his QTH in Christchurch, New
Zealand. He reguarly works stations in Australia with ease using a
a fixed 10 element beam pointed 30 deg above the horizon on the uplink
and using a collinear antenna for the downlink. ZL3VTV is looking for
to work more ZL's and would entertain schedules. [ZL3VTV @ZL3AC]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current

set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

186. ANS Bulletin 036.05

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 05:55:10 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-036.05.1994@ampr.org>
Source record: 28037
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-036.05
AO-13 ZRO TEST SCHEDULES!

HR AMSAT NEWS SERVICE BULLETIN 036.05 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-036.05

AO-13 ZRO Tests Begin For '94

AMSAT-OSCAR-13

ZRO TEST SCHEDULE

FEBRUARY-MARCH 1994

The ZRO Memorial Technical Achievement Award Program, or just
"ZRO Test" has a new schedule for February and March, 1994, via
AMSAT-OSCAR-13. This activity is a test of operating skill and equipment
performance.

During a typical ZRO run, a control station will send numeric
code groups using CW at 10 words-per-minute. At the beginning of the
run, uplink power from the control station is set to match the general
beacon downlink strength. This is level "zero". The control operator
will send and repeat a random five-digit number, then lower his uplink
power by 3 dB (half power) and repeat the procedure with a new random
number (level "1"). This will continue to a level 30 dB below the beacon
(level "A").

A participating listener monitors the downlink signals until he
or she can no longer copy the numbers. Those who can hear the beacon
will qualify for the basic award by copying the code group heard at level
"zero". The challenge is to improve home-station performance to a point
where the lower-level downlink signals can be copied (levels 6 through
A). To date, only one station, Darrel Emerson (AA7FV), has successfully
copied level "A".

The following schedule of Mode "B" tests were chosen for convenient
operating times and favorable squint angles. The tests can be heard on
145.840 MHz. Andy WA5ZIB will conduct all the tests. Mode "JL" tests
will no longer occur due to the failure of AO-13's 70-cm transmitter.

Day Date (UTC) Time Areas covered

Saturday Feb. 12, 1994 2345 UTC NA, SA, Europe, W. Africa
Sunday Feb. 20, 1994 0330 UTC NA, NW SA, Japan, Pacific

Saturday Feb. 26, 1994 1930 UTC NA, SA, Europe, Africa, ME
Saturday Mar. 19, 1994 1930 UTC NA, SA, Europe, Africa
Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC", thus the second test occurs at 9:30 PM CST Saturday night (the 19th). Any changes will be announced as soon as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy MacAllister WA5ZIB, AMSAT V.P. User Operations, 14714 Knights Way Drive, Houston, TX 77083-5640. A report will be returned verifying the level of accurate reception. An S.A.S.E. is appreciated but not required.

Information about the AMSAT Awards Program can be found on page 197 of the "Proceedings of the AMSAT-NA Tenth Space Symposium" (1992). This paper, covering all the AMSAT-NA awards including specifics on the ZRO Test, was reprinted on page 10 in the March/April 1993 issue of "The AMSAT Journal". The ZRO Test information provided in the article covers test procedures, means for obtaining certificates and gives some historical background about the program. Reprints of the article can be obtained for an S.A.S.E. to WA5ZIB at the address above.

/EX

187. ANS Bulletin 036.04

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 05:55:17 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-036.04.1994@ampr.org>
Source record: 28038
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-036.04
OSCAR-21 CELEBRATES THIRD BIRTHDAY

HR AMSAT NEWS SERVICE BULLETIN 036.04 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-036.04

OSCAR-21 CELEBRATES THIRD BIRTHDAY

On 29 January 1991 the first international Orbiting Satellite Carrying
Amateur Radio (OSCAR) in which radio amateurs from the former
Soviet Union (CIS) worked together with radio amateurs from
Germany was successfully launched.

The official name of the project was RM1, which stands for "RADIO M-1".
The digital transponder RUDAK-2 is part of RM1.

After the launch from the Northern Cosmodrome in Plesetsk, Russia
the satellite was named as AMSAT-OSCAR 21, to emphasize that the
spacecraft was built by, and for, Radio Amateurs around the world.

AMSAT OSCAR-21 is an attached secondary payload (Piggy-back) aboard
the CIS geological research satellite "INFORMATOR-1".

OSCAR-21 (also known as RS-14) is a joint project between AMSAT-U
in Russia and AMSAT-DL in Germany.

Two UUENCODED files which show the RUDAK hardware and two pictures taken from
an original launch video have been uploaded to AMSAT-BB by DB2OS. The picture
is compressed using CJPEG.

ANS thanks Peter Guelzow DB2OS for this item.

/EX

188. ANS Bulletin 036.03

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 05:55:22 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-036.03.1994@ampr.org>
Source record: 28039
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-036.03
AMSAT NET ON GALAXY 3

HR AMSAT NEWS SERVICE BULLETIN 036.03 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-036.03

AMSAT NET ON GALAXY 3

Satellite users may be interested in an experimentbeing conducted in the Houston, Texas area. The group there is uplinking the Houston Area Amsat Net, heard locally on the 147.10 FM repeater, to Galaxy 3, Channel 17, 5.8 Mhz. audio subcarrier (Shop-At-Home Channel). This net is carried in realtime on Tuesday evening, from approximately 10PM (CST) until completion at approximately 10:30 - 10:45 PM. This is an experiment but could be continued on a regular basis if interest is sufficient. Please send reports of your reception and your comments to: davidsonc@tcd.jsc.nasa.gov via Internet, or call (713) 483-0078 during business hours, or during the uplink period (713) 595-2393. Ask for Craig Davidson, WD5BDX.

ANS wishes to thank Craig Davidson WD5BDX for this information.

/EX

189. ANS Bulletin 036.02

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 05:55:34 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-036.02.1994@ampr.org>
Source record: 28040
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-036.02
SAREX UPDATE AS OF FEB 6 at 00:30 UTC

HR AMSAT NEWS SERVICE BULLETIN 036.02 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-036.02

SAREX Begins Operation

SAREX was officially activated at 14:27 UTC on February 4 with a successful voice contact through the University of Surrey amateur radio station. Doug Loughmiller, G0SYX was the operator at the microphone to intitate the first contact with the STS-60 crew.

The SAREX team reports a highly successful direct contact one orbit later with a school group in Boise Idaho. The contact, held at the Discovery Center included students from several schools including the Boise Senior High School. 19 students were able to ask direct questions to Shuttle Commander Charlie Bolden.

The packet robot has also been quite active. The packet QSO sequence number exceeded the 800 mark about 30 hours after SAREX operations was initiated.

Problems with RFI on the Wake Shield Facility have delayed the deployment of this primary payload. This has affected the SAREX payload somewhat. Currently, the Mars, Pennsylvania school contact, which was scheduled for today, has been postponed until the Wake Shield issues have been resolved.

The official SAREX element set for today will be GSFC-003. Gil Carman, WA5NOM reports that the predictions using GSFC-003 are 1 second later than the current orbiter state vector.

1 22977U 94006A 94 35.13981770 0.00000202 00000-0 58718-5 0 37
2 22977 56.9857 213.2731 0008535 263.0773 96.9324 15.72145611 115

Satellite: STS-60
Catalog number: 22977
Epoch time: 94035.13981770 (04 FEB 94 03:21:20.25 UTC)
Element set: GSFC-003
Inclination: 56.9857 deg
RA of node: 213.2731 deg Space Shuttle Flight STS-60
Eccentricity: 0.0008535 Keplerian Elements
Arg of perigee: 263.0773 deg

Mean anomaly: 96.9324 deg
Mean motion: 15.72145611 rev/day Semi-major Axis: 6730.8981 Km
Decay rate: 0.20E-05 rev/day*2 Apogee Alt: 358.25 Km
Epoch rev: 11 Perigee Alt: 346.77 Km

NOTE - This element set is based on NORAD element set # 003.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

ANS thanks Frank H. Bauer, KA3HDO, of the SAREX Working Group for this item.

/EX

190. ANS Bulletin 036.01

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 05:55:49 UTC
From: 70323.2750@CompuServe.COM
Message-ID: <$ans-036.01.1994@ampr.org>
Source record: 28041
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-036.01
STS-60 SAREX Mission Begins

HR AMSAT NEWS SERVICE BULLETIN 036.01 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-036.01

STS-60 News as of 3 February 1994 at 12:30 UTC

The Space Shuttle Discovery made a spectacular, historic, on-time liftoff this morning from the Kennedy Space Center. Discovery's launch marks the first joint U.S.-Russian Space Shuttle Flight. This will be the first of several joint missions planned in preparation for the development of the international Space Station. Cosmonaut Sergei Krikalev, U5MIR, was one of the six crew members on board this morning's Shuttle flight. His fellow American crew mates include Commander Charlie Bolden, KE4IQB, Pilot Ken Reightler, and Mission Specialists Jan Davis, Ron Sega, KC5ETH, and Franklin Chang-Diaz. The primary payloads on-board Discovery are the Wake Shield Facility, which will be deployed and retrieved during the flight and the Spacehab facility. Of particular interest to radio amateurs is the Shuttle Amateur Radio Experiment (SAREX) secondary payload. SAREX information for STS-60 including frequencies, callsigns and Keplerian elements, follows:

STS-60 Shuttle Amateur Radio Experiment (SAREX)
Information Sheet

Mission: STS-60 Space Shuttle Discovery
Wake Shield Facility & Spacehab-2 Mission

Launch: February 3, 1994, 12:10 UTC

Orbit: 57 degree inclination

Mission Length: 8 days (Nominal)

Amateur
Radio
Operators: Charlie Bolden, KE4IQB, Ron Sega, KC5ETH,
Sergei Krikalev, U5MIR

Modes: FM Voice
Prime callsign: KE4IQB

Packet Radio
Callsign: W5RRR-1

Frequencies: All operations in split mode. Do not transmit on
the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks: 144.91, 144.93, 144.95, 144.97, 144.99 MHz
(Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: the crew will not favor any specific uplink
frequency, so your ability to work the crew will
be the "luck of the draw"

Packet Freqs: Downlink: 145.55 MHz
Uplink: 144.49 MHz

Info: Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland,
SAREX Bulletins and Shuttle Retransmissions
3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz
and 147.45 MHz (FM)

Johnson Space Center ARC, W5RRR, Houston, Texas
SAREX Bulletins
7225 KHz, 14,280 KHz, 21,395 KHz, 28,650 KHz, (SSB)
and 146.64 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT
SAREX News Bulletins
3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz
and 147.555 MHz (FM)

Also, bulletins available on internet, via AMSAT ANS,
Compuserve, and your local PBSS.

School Group Participation: 5 school groups will participate
in SAREX with pre-scheduled direct
and telebridge contacts. These include
4 in the U.S., and one in Russia.

ANS wishes to thank Frank Bauer KA3HDO AMSAT VP for Manned Space Programs for
this information.

/EX

191. STS-60 SAREX QSL lists

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 18:42:07 UTC
From: manfred@isi5.ssl.berkeley.edu
Message-ID: <2j3dlv$42k@agate.berkeley.edu>
Source record: 28050

Here are two sets of STS-60 SAREX QSL lists (times are UTC) as recorded in the San Francisco Bay Area (the first set by KC6ROL, the second by DL5KR):

Orbit 34:

W5RRR-1>QSL [02/05/93 14:39:21] <UI>:
G0SYX/812 G3RWL/810 VE3AA/809 VE3TIR/808 KB8KPV/805 W7US/802 KB2MVN/800 VE3BDR/796 KG3N/795 N2NRD/794 W2RS/792 VK3ACC/778 VK5AGR/777 VK6ZLK/773 OH9MMN/763

Orbit 50:

W5RRR-1>QSL [02/06/93 15:05:17] <UI>:
WB6FJE/1494 OZ8QI/1481 N9JGQ/1443 KD8SI/1439 K5VAS/1423 W5IU/1419 OE3CV/1382 SM4EFW/1374 OE8PCK/1362 KD4HSL/1296 WP4LBK/1287 LA9QN/1241 VK3YIC/1221 VK2ZW/1217 VK4CHB/1202

Hope you find your call sign in it. Did anyone record a QSL message with numbers in the high 900's (say around #976)?

Best 73,
Manfred --- W6/DL5KR

192. Re: RS-14?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-06 21:33:58 UTC
From: jmorris@mu.apana.org.au
Message-ID: <760570438.63snx@mu.apana.org.au>
Source record: 28049

In article <00979988.29C9C4C0@vms.csd.mu.edu> bargholzg@vms.csd.mu.edu writes:
>
>I heard a cw beacon on 145.820. IDing itself as RS14.
>Anyone have a Norad number on this, or another name?
>Can't find RS14 in the standard Kelp set.

RS-14 is also known as AO-21, Radio-M1, and RUDAK-2.

It's NORAD number is 21087, and is usually listed with the name
'Informator-1' (which is the actual platform).

It's a very easy satellite to recieve on 2m FM, with another downlink
around 145.990 MHz. (Telemetry, voice, pre-recorded messages).

>Please Mail direct:
>in%"bargholzg@vms.csd.mu.edu"

Our mail is broken at the moment, sorry.

JM
--
James Morris VK2GVA
<internet: jmorris@mu.apana.org.au>

193. Daily IPS Report - 6 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 00:32:35 UTC
From: dave@eram.esi.com.au
Message-ID: <5170@eram.esi.com.au>
Source record: 28045
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 5 February 1994
Summary for 5 February and Forecast up to 8 February
IPS Warning 03 was issued on 3 Feb and is current for 7-11 Feb.

1A. SOLAR SUMMARY
Activity: very low

Flares: None.

Observed 10.7 cm flux/Equivalent Sunspot Number : 093/040

1B. SOLAR FORECAST
06 February 07 February 08 February
Activity Very low Very low Very low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 090/037

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : mostly quiet to unsettled

Estimated Indices : A K Observed A Index 4 February
Learmonth 11 2324 2232
Fredericksburg 18 10
Planetary 18 08

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
06 Feb 08 Unsettled, active conditions may begin by the end of
today.
07 Feb 16 Active.
08 Feb 20 Active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
05 Feb normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
06 Feb normal normal fair
07 Feb normal fair poor
08 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values to 30% enhanced
during local night.

T index: 50

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
06 Feb 40 Near predicted monthly values.
07 Feb 0 About 20% below predicted monthly values.
08 Feb 10 About 15% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

194. Daily IPS Report - 7 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 00:33:18 UTC
From: dave@eram.esi.com.au
Message-ID: <5171@eram.esi.com.au>
Source record: 28046
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

```
IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 6 February 1994
Summary for 6 February and Forecast up to 9 February
IPS Warning 03 was issued on 03 Feb and is current
for interval 07-11 Feb.
------------------------------------------------------------

1A. SOLAR SUMMARY
Activity: Very low.

Flares: None.

Observed 10.7 cm flux/Equivalent Sunspot Number : 95/41

1B. SOLAR FORECAST
07 February 08 February 09 February
Activity Very low Very low Very low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 94/40

1C. SOLAR COMMENT
None.
------------------------------------------------------------

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : storm levels

Estimated Indices : A K Observed A Index 5 February
Learmonth 57 6345 6665
Fredericksburg 41 21
Planetary 55 24

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
07 Feb 40 Active to minor storm.
08 Feb 25 Active.
09 Feb 20 Active.

2C. MAGNETIC COMMENT
Magnetic activity commenced earlier and was more severe than
expected. This activity is probably due to a coronal hole.
Minor storm periods are expected for today then declining
to active periods over next three days.
```

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
06 Feb normal normal fair
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
07 Feb poor poor poor
08 Feb fair poor poor
09 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Degraded HF comms began yesterday and expected to continue
for today. High lats can expect degraded comms over next
four days.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were about 10-20% below predicted monthly values

T index: -4

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
07 Feb 0 About 30% below predicted monthly values.
08 Feb 20 About 15% below predicted monthly values.
09 Feb 30 About 10% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded HF comms expected during Feb 7-11.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

195. APT-Satellites: Report FEB 05, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 10:00:36 UTC
From: peter.henne@gmd.de
Message-ID: <1994Feb7.100036.4994@gmd.de>
Source record: 28047
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, FEB 05, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 ON again
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)
Meteor 3-3: APT *OFF*
Meteor 3-4: APT *OFF*
Meteor 3-5: APT *OFF*
Meteor 3-6: APT *OFF*

Except for the poor Meteor 2-21 there was *NO* APT
from any other Meteor during all available dayligth-
passes on Feb 05 and Feb 06 136.00 to 137.99 MHz.
VHF-conflict NOAA-10/NOAA-12 ended, NOAA-10 is active
again.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53757 St.AUGUSTIN, Germany |
+----------------------------------------+
```

196. Please post FAQ

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 16:14:57 UTC
From: sly46@cc.usu.edu
Message-ID: <1994Feb7.101457.9906@cc.usu.edu>
Source record: 28048

Please post the FAQs.

Thanx,
Markus

197. Insta-Track

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 22:06:00 UTC
From: jangus@skyld.tele.com
Message-ID: <760658760snx@skyld.tele.com>
Source record: 28051

Here's an interesting problem for you. IT requires a math co-processor if you wish it to run reasonably fast. Off to Fry's for a CP. (IT ran fine on the 386SX as ITNCP) First one was a ULSI co-processor for $65. It scrambles the display and does all sorts of weird things. Usually with sin error messages on the screen. Back to Fry's and go get the ITT (Integrated Information Technologies) co-processor. This one worked like a champ. I remember hearing somewhere that IT requires that the co-processor do more than just deal with floating point addition. And that the inability to do transcendatal operations was what caused the problems with IT and some of the Cheaper co-processor clones. I know that the Intel chip works fine. But thought I would pass this warning on about some of the cheaper chips.

73 es GM from Jeff (Still trying to get a connect with either STS or MIR)

Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA | "It is difficult to imagine our
Internet: jangus@skyld.tele.com | universe run by a single omni-
US Mail: PO Box 4425 Carson, CA 90749 | potent god. I see it more as a
Phone: 1 (310) 324-6080 | badly run corporation."

198. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 23:31:03 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.760663863@afit.af.mil>
Source record: 28052

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 60
1 22977U 94006A 94038.25000000 .00000289 00000-0 64918-5 0 91
2 22977 56.9888 199.2915 0009132 272.8919 56.8375 15.72311414 588
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

199. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-02-07 23:31:19 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.760663879@afit.af.mil>
Source record: 28053
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 60
1 22977U 94006A 94038.25000000 .00000289 00000-0 64918-5 0 91
2 22977 56.9888 199.2915 0009132 272.8919 56.8375 15.72311414 588
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

200. MIR

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 00:20:23 UTC
From: jangus@skyld.tele.com
Message-ID: <760648237snx@skyld.tele.com>
Source record: 28054

Anybody have recent KEPS for the MIR craft?
I noticed that R0MIR was up and running this weekend along with STS

Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA | "It is difficult to imagine our
Internet: jangus@skyld.tele.com | universe run by a single omni-
US Mail: PO Box 4425 Carson, CA 90749 | potent god. I see it more as a
Phone: 1 (310) 324-6080 | badly run corporation."

201. SAREX Keps for Feb 8

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 02:51:06 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-60.009.1994@ampr.org>
Source record: 28055
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-60.009
SAREX Keps for Feb. 8

The official SAREX element set for today will be GSFC-009. This element set was generated by Ron Parise, WA4SIR of the Goddard Space Flight Center. Gil Carman, WA5NOM reports that the predictions using GSFC-009 differed from GSFC-005 by approximately 11 seconds.

STS-60
1 22977U 94006A 94 38.25534638 0.00000289 00000-0 64918-5 0 90
2 22977 56.9888 199.2675 0009131 272.9026 87.0997 15.72311412 607

Satellite: STS-60
Catalog number: 22977
Epoch time: 94038.25534638 (07 FEB 94 06:07:41.93 UTC)
Element set: GSFC-009
Inclination: 56.9888 deg
RA of node: 199.2675 deg Space Shuttle Flight STS-60
Eccentricity: 0.0009131 Keplerian Elements
Arg of perigee: 272.9026 deg
Mean anomaly: 87.0997 deg
Mean motion: 15.72311412 rev/day Semi-major Axis: 6730.4250 Km
Decay rate: 0.29E-05 rev/day*2 Apogee Alt: 358.18 Km
Epoch rev: 60 Perigee Alt: 345.89 Km

NOTE - This element set is based on NORAD element set # 009.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

202. STS-60 Eastern R/S Times 02/08

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 02:51:45 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-60.010.1994@ampr.org>
Source record: 28056
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-60.010
STS-60 Eastern R/S Times 02/08

Below are the rise and set times for STS-60 for selected US cities over the next four days. This data was generated to help hams without orbit programs to participate in the SAREX activities. Please note that the times shown are UTC and NOT LOCAL TIME. This listing includes only those passes with an elevation greater than 5 degrees. For information regarding SAREX frequencies and operations procedures, check your local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

STS-60 will be visible from far northern latitudes for the next several mornings. If a shuttle pass occurs less than one hour before your local sunrise time, but before the morning twilight is too bright, the shuttle will appear as a bright star moving across the sky. If a pass occurs exactly one hour before sunrise, the orbiter may enter daylight while overhead, appearing suddenly out of the darkness.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

New York City STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 09:42:36 09:46:50 09:50 13 A-E 78
08Feb94 11:16:32 11:21:26 11:25 40 A-W 79
08Feb94 12:53:17 12:57:02 13:00 8 A-W 80
08Feb94 16:06:05 16:09:52 16:13 7 D-E 82
08Feb94 17:40:32 17:45:31 17:50 38 D-E 83
08Feb94 19:15:45 19:20:07 19:24 14 D-W 84

09Feb94 10:08:20 10:13:15 10:17 50 A-E 94
09Feb94 11:43:53 11:48:20 11:52 15 A-W 95
09Feb94 16:32:32 16:37:03 16:41 15 D-E 98
09Feb94 18:07:10 18:12:11 18:16 51 D-W 99

10Feb94 09:01:01 09:05:17 09:09 14 A-E 109
10Feb94 10:35:00 10:39:54 10:44 38 A-W 110
10Feb94 12:11:46 12:15:30 12:18 7 A-W 111

10Feb94 15:24:32 15:28:21 15:31 8 D-E 113
10Feb94 16:58:59 17:03:59 17:08 39 D-E 114
10Feb94 18:34:13 18:38:34 18:42 14 D-W 115

11Feb94 09:26:47 09:31:42 09:36 53 A-E 125
11Feb94 11:02:23 11:06:48 11:10 15 A-W 126
11Feb94 15:50:59 15:55:31 15:59 16 D-E 129
11Feb94 17:25:38 17:30:38 17:35 49 D-W 130

Washington D.C. STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 09:42:03 09:46:07 09:49 11 A-E 78
08Feb94 11:15:47 11:20:41 11:25 42 A-W 79
08Feb94 12:52:43 12:56:16 12:59 6 A-W 80
08Feb94 17:40:35 17:45:22 17:49 22 D-E 83
08Feb94 19:15:27 19:20:11 19:24 23 D-W 84

09Feb94 10:07:38 10:12:31 10:16 44 A-E 94
09Feb94 11:43:10 11:47:34 11:51 15 A-W 95
09Feb94 16:32:42 16:36:47 16:40 10 D-E 98
09Feb94 18:07:04 18:12:09 18:16 83 D-E 99
09Feb94 19:43:09 19:46:27 19:49 5 D-W 100

10Feb94 09:00:28 09:04:34 09:08 12 A-E 109
10Feb94 10:34:15 10:39:09 10:43 40 A-W 110
10Feb94 12:11:12 12:14:45 12:17 6 A-W 111
10Feb94 16:59:01 17:03:49 17:08 23 D-E 114
10Feb94 18:33:55 18:38:38 18:42 22 D-W 115

11Feb94 09:26:04 09:30:58 09:35 46 A-E 125
11Feb94 11:01:40 11:06:02 11:09 14 A-W 126
11Feb94 15:51:08 15:55:15 15:58 10 D-E 129
11Feb94 17:25:32 17:30:36 17:35 86 D-E 130
11Feb94 19:01:41 19:04:53 19:07 5 D-W 131

Atlanta, GA STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 09:40:35 09:44:05 09:47 7 A-E 78
08Feb94 11:13:38 11:18:32 11:22 49 A-W 79
08Feb94 17:41:32 17:44:52 17:47 5 D-E 83
08Feb94 19:15:17 19:20:20 19:24 63 D-E 84
08Feb94 20:51:29 20:54:41 20:57 5 D-W 85

09Feb94 10:05:40 10:10:25 10:14 30 A-E 94
09Feb94 11:41:03 11:45:22 11:49 13 A-W 95
09Feb94 18:07:24 18:11:59 18:16 16 D-E 99
09Feb94 19:42:06 19:46:50 19:51 23 D-W 100

10Feb94 08:58:59 09:02:31 09:05 7 A-E 109
10Feb94 10:32:06 10:37:00 10:41 46 A-W 110

10Feb94 16:59:57 17:03:21 17:06 5 D-E 114
10Feb94 18:33:44 18:38:47 18:43 67 D-E 115

11Feb94 09:24:06 09:28:52 09:33 32 A-E 125
11Feb94 10:59:35 11:03:50 11:07 13 A-W 126
11Feb94 17:25:50 17:30:26 17:34 17 D-E 130
11Feb94 19:00:35 19:05:17 19:09 22 D-W 131

Miami, FL STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 09:38:08 09:42:46 09:46 23 A-E 78
08Feb94 11:13:30 11:17:36 11:21 11 A-W 79
08Feb94 19:17:35 19:22:32 19:26 39 D-E 84
08Feb94 20:53:44 20:56:59 20:59 5 D-W 85

09Feb94 10:04:25 10:09:18 10:13 49 A-W 94
09Feb94 18:10:07 18:14:10 18:17 10 D-E 99
09Feb94 19:44:17 19:49:05 19:53 28 D-W 100

10Feb94 08:56:34 09:01:13 09:05 25 A-E 109
10Feb94 10:31:59 10:36:04 10:39 11 A-W 110
10Feb94 18:36:02 18:41:00 18:45 42 D-E 115
10Feb94 20:12:14 20:15:26 20:18 5 D-W 116

11Feb94 09:22:53 09:27:45 09:32 46 A-W 125
11Feb94 17:28:31 17:32:38 17:36 10 D-E 130
11Feb94 19:02:46 19:07:32 19:11 27 D-W 131

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-60.011
STS-60 Central R/S Times 02/08

Below are the rise and set times for STS-60 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

STS-60 will be visible from far northern latitudes for the next several
mornings. If a shuttle pass occurs less than one hour before your local
sunrise time, but before the morning twilight is too bright, the shuttle
will appear as a bright star moving across the sky. If a pass occurs
exactly one hour before sunrise, the orbiter may enter daylight while
overhead, appearing suddenly out of the darkness.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry:B A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Chicago, IL STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 11:14:56 11:19:45 11:24 33 A-E 79
08Feb94 12:50:02 12:54:41 12:58 21 A-W 80
08Feb94 14:27:08 14:30:36 14:33 6 A-W 81
08Feb94 16:03:43 16:07:01 16:09 5 D-E 82
08Feb94 17:38:34 17:43:06 17:47 15 D-E 83
08Feb94 19:13:13 19:18:16 19:22 59 D-W 84

09Feb94 10:07:56 10:11:51 10:15 10 A-E 94
09Feb94 11:41:22 11:46:20 11:50 59 A-W 95
09Feb94 13:17:41 13:21:46 13:25 10 A-W 96
09Feb94 16:30:29 16:34:23 16:37 8 D-E 98
09Feb94 18:05:03 18:10:02 18:14 37 D-E 99
09Feb94 19:40:12 19:44:40 19:48 16 D-W 100

10Feb94 10:33:23 10:38:12 10:42 34 A-E 110
10Feb94 12:08:30 12:13:09 12:17 20 A-W 111
10Feb94 13:45:37 13:49:04 13:52 6 A-W 112
10Feb94 15:22:10 15:25:30 15:28 5 D-E 113
10Feb94 16:57:01 17:01:34 17:05 16 D-E 114
10Feb94 18:31:40 18:36:43 18:41 56 D-W 115

11Feb94 09:26:18 09:30:17 09:33 10 A-E 125
11Feb94 10:59:50 11:04:48 11:09 56 A-W 126
11Feb94 12:36:12 12:40:15 12:43 10 A-W 127
11Feb94 15:48:57 15:52:52 15:56 8 D-E 129
11Feb94 17:23:30 17:28:30 17:33 38 D-E 130
11Feb94 18:58:41 19:03:07 19:07 15 D-W 131

Huntsville, AL STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 11:13:29 11:18:26 11:22 79 A-W 79
08Feb94 12:50:14 12:53:46 12:56 7 A-W 80
08Feb94 17:40:59 17:44:17 17:47 5 D-E 83
08Feb94 19:14:46 19:19:48 19:24 53 D-E 84
08Feb94 20:50:41 20:54:13 20:57 6 D-W 85

09Feb94 10:05:48 10:10:22 10:14 21 A-E 94
09Feb94 11:40:37 11:45:10 11:49 19 A-W 95
09Feb94 18:06:55 18:11:25 18:15 15 D-E 99

09Feb94 19:41:31 19:46:21 19:50 28 D-W 100

10Feb94 10:31:56 10:36:53 10:41 74 A-W 110
10Feb94 12:08:44 12:12:14 12:15 6 A-W 111
10Feb94 16:59:25 17:02:46 17:05 5 D-E 114
10Feb94 18:33:13 18:38:16 18:42 56 D-E 115
10Feb94 20:09:10 20:12:39 20:15 6 D-W 116

11Feb94 09:24:13 09:28:49 09:32 22 A-E 125
11Feb94 10:59:07 11:03:38 11:07 18 A-W 126
11Feb94 17:25:21 17:29:53 17:33 16 D-E 130
11Feb94 19:00:00 19:04:48 19:09 27 D-W 131

Houston, TX STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 11:11:20 11:16:14 11:20 52 A-E 79
08Feb94 12:47:39 12:51:19 12:54 7 A-W 80
08Feb94 19:15:11 19:19:22 19:23 11 D-E 84
08Feb94 20:49:28 20:54:20 20:58 32 D-W 85

09Feb94 10:04:14 10:08:15 10:11 11 A-E 94
09Feb94 11:38:09 11:42:52 11:47 26 A-W 95
09Feb94 19:41:15 19:46:13 19:50 41 D-E 100
09Feb94 21:17:09 21:20:41 21:23 6 D-W 101

10Feb94 10:29:47 10:34:41 10:39 56 A-E 110
10Feb94 12:06:09 12:09:48 12:12 7 A-W 111
10Feb94 18:33:37 18:37:50 18:41 11 D-E 115
10Feb94 20:07:56 20:12:47 20:17 31 D-W 116

11Feb94 09:22:37 09:26:42 09:30 11 A-E 125
11Feb94 10:56:38 11:01:19 11:05 25 A-W 126
11Feb94 18:59:42 19:04:41 19:09 43 D-E 131
11Feb94 20:35:42 20:39:07 20:42 6 D-W 132

Denver, CO (Seattle has been moved to the west coast bulletin)
STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 11:14:07 11:17:21 11:20 5 A-E 79
08Feb94 12:46:43 12:51:41 12:56 86 A-W 80
08Feb94 14:22:54 14:26:59 14:30 10 A-W 81
08Feb94 19:11:22 19:15:59 19:20 17 D-E 84
08Feb94 20:46:04 20:51:00 20:55 37 D-W 85

09Feb94 11:39:00 11:43:37 11:47 22 A-E 95
09Feb94 13:13:42 13:18:26 13:22 24 A-W 96
09Feb94 14:51:05 14:54:17 14:56 5 A-W 97
09Feb94 18:03:28 18:07:19 18:10 8 D-E 99
09Feb94 19:37:49 19:42:52 19:47 50 D-E 100
09Feb94 21:13:19 21:17:20 21:20 10 D-W 101

10Feb94 10:32:31 10:35:47 10:38 6 A-E 110
10Feb94 12:05:10 12:10:09 12:14 82 A-W 111
10Feb94 13:41:23 13:45:28 13:49 10 A-W 112
10Feb94 18:29:49 18:34:27 18:38 17 D-E 115
10Feb94 20:04:31 20:09:27 20:13 35 D-W 116

11Feb94 10:57:25 11:02:04 11:06 23 A-E 126
11Feb94 12:32:12 12:36:53 12:41 23 A-W 127
11Feb94 14:09:37 14:12:46 14:15 5 A-W 128
11Feb94 17:21:54 17:25:47 17:29 8 D-E 130
11Feb94 18:56:16 19:01:19 19:05 52 D-E 131
11Feb94 20:31:49 20:35:46 20:39 9 D-W 132

Compiled by Dan Schultz, N8FGV
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/EX

SB SAREX @ AMSAT $STS-60.012
STS-60 Western R/S Times 02/08

Below are the rise and set times for STS-60 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

STS-60 will be visible from far northern latitudes for the next several
mornings. If a shuttle pass occurs less than one hour before your local
sunrise time, but before the morning twilight is too bright, the shuttle
will appear as a bright star moving across the sky. If a pass occurs
exactly one hour before sunrise, the orbiter may enter daylight while
overhead, appearing suddenly out of the darkness.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Seattle, WA (Denver has been moved to the central US bulletin)
STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 12:48:07 12:51:18 12:54 5 A-E 80
08Feb94 14:20:33 14:25:30 14:29 52 A-E 81
08Feb94 15:55:45 16:00:33 16:04 25 A-W 82
08Feb94 17:31:47 17:36:14 17:40 14 D-W 83

08Feb94 19:07:15 19:12:00 19:16 21 D-E 84
08Feb94 20:42:08 20:47:13 20:51 80 D-W 85
08Feb94 22:17:38 22:21:32 22:24 9 D-W 86

09Feb94 13:13:01 13:17:30 13:21 18 A-E 96
09Feb94 14:47:10 14:52:10 14:56 52 A-W 97
09Feb94 16:23:00 16:27:34 16:31 17 A-W 98
09Feb94 17:58:51 18:03:23 18:07 15 D-E 99
09Feb94 19:33:56 19:38:56 19:43 38 D-E 100
09Feb94 21:08:55 21:13:43 21:18 25 D-W 101

10Feb94 12:06:31 12:09:45 12:12 5 A-E 111
10Feb94 13:39:00 13:43:58 13:48 54 A-E 112
10Feb94 15:14:13 15:19:01 15:23 25 A-W 113
10Feb94 16:50:15 16:54:42 16:58 14 D-W 114
10Feb94 18:25:42 18:30:28 18:34 21 D-E 115
10Feb94 20:00:35 20:05:41 20:10 77 D-W 116
10Feb94 21:36:07 21:39:59 21:43 8 D-W 117

11Feb94 12:31:26 12:35:57 12:39 18 A-E 127
11Feb94 14:05:39 14:10:37 14:15 50 A-W 128
11Feb94 15:41:30 15:46:02 15:50 17 A-W 129
11Feb94 17:17:20 17:21:52 17:25 16 D-E 130
11Feb94 18:52:23 18:57:24 19:01 40 D-E 131
11Feb94 20:27:23 20:32:09 20:36 24 D-W 132

Albuquerque, NM STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 11:12:34 11:16:05 11:19 7 A-E 79
08Feb94 12:45:37 12:50:32 12:54 52 A-W 80
08Feb94 14:22:48 14:26:01 14:28 5 A-W 81
08Feb94 19:12:37 19:16:25 19:19 7 D-E 84
08Feb94 20:46:42 20:51:45 20:56 88 D-E 85

09Feb94 11:37:40 11:42:25 11:46 30 A-E 95
09Feb94 13:12:58 13:17:21 13:21 15 A-W 96
09Feb94 19:38:42 19:43:27 19:47 22 D-E 100
09Feb94 21:13:38 21:18:12 21:22 18 D-W 101

10Feb94 10:30:58 10:34:31 10:37 7 A-E 110
10Feb94 12:04:04 12:08:59 12:13 49 A-W 111
10Feb94 13:41:18 13:44:30 13:47 5 A-W 112
10Feb94 18:31:03 18:34:53 18:38 8 D-E 115
10Feb94 20:05:09 20:10:13 20:14 85 D-W 116

11Feb94 10:56:05 11:00:52 11:05 32 A-E 126
11Feb94 12:31:29 12:35:49 12:39 14 A-W 127
11Feb94 18:57:09 19:01:55 19:06 22 D-E 131
11Feb94 20:32:07 20:36:39 20:40 17 D-W 132

Los Angeles, CA STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 12:43:58 12:48:45 12:53 33 A-E 80
08Feb94 14:19:27 14:23:43 14:27 13 A-W 81
08Feb94 20:45:31 20:50:11 20:54 19 D-E 85
08Feb94 22:20:21 22:24:59 22:29 20 D-W 86

09Feb94 11:37:12 11:40:51 11:44 8 A-E 95
09Feb94 13:10:27 13:15:21 13:19 43 A-W 96
09Feb94 19:37:59 19:41:35 19:44 6 D-E 100
09Feb94 21:11:54 21:16:58 21:21 80 D-E 101

10Feb94 12:02:25 12:07:13 12:11 34 A-E 111
10Feb94 13:37:56 13:42:11 13:45 13 A-W 112
10Feb94 20:03:58 20:08:39 20:12 19 D-E 116
10Feb94 21:38:49 21:43:26 21:47 19 D-W 117

11Feb94 10:55:33 10:59:18 11:02 8 A-E 126
11Feb94 12:28:56 12:33:48 12:38 41 A-W 127
11Feb94 18:56:24 19:00:04 19:03 7 D-E 131
11Feb94 20:30:22 20:35:25 20:39 85 D-E 132

Honolulu, HI STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 01:00:19 01:05:15 01:09 39 D-E 72
08Feb94 14:11:23 14:15:28 14:19 11 A-E 81
08Feb94 15:45:38 15:50:06 15:54 18 A-W 82
08Feb94 23:53:00 23:56:55 00:00 9 D-E 87

09Feb94 01:27:02 01:31:47 01:36 26 D-W 88
09Feb94 14:37:02 14:41:57 14:46 73 A-E 97

10Feb94 00:18:46 00:23:43 00:28 42 D-E 103
10Feb94 13:29:48 13:33:55 13:37 12 A-E 112
10Feb94 15:04:07 15:08:34 15:12 17 A-W 113
10Feb94 23:11:25 23:15:23 23:18 9 D-E 118

11Feb94 00:45:31 00:50:14 00:54 24 D-W 119
11Feb94 13:55:29 14:00:24 14:04 78 A-E 128
11Feb94 23:37:12 23:42:10 23:46 45 D-E 134

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-60.013
STS-60 World R/S Times 02/08

Below are the rise and set times for STS-60 for selected worldwide cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only

those passes with an elevation greater than 5 degrees. For information regarding SAREX frequencies and operations procedures, check your local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

STS-60 will be visible from far northern latitudes for the next several mornings. If a shuttle pass occurs less than one hour before your local sunrise time, but before the morning twilight is too bright, the shuttle will appear as a bright star moving across the sky. If a pass occurs exactly one hour before sunrise, the orbiter may enter daylight while overhead, appearing suddenly out of the darkness.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

London, England STS-60 Element Set GSFC-005

date rise tca set el geo orbit
08Feb94 05:11:22 05:14:57 05:18 7 A-E 75
08Feb94 06:44:13 06:49:10 06:53 48 A-E 76
08Feb94 08:19:09 08:24:07 08:28 38 A-W 77
08Feb94 09:54:38 09:59:31 10:03 27 D-E 78
08Feb94 11:29:45 11:34:50 11:39 57 D-E 79
08Feb94 13:04:44 13:09:32 13:13 25 D-W 80

09Feb94 05:36:36 05:41:10 05:45 19 A-E 91
09Feb94 07:10:46 07:15:48 07:20 70 A-W 92
09Feb94 08:46:08 08:51:01 08:55 28 D-W 93
09Feb94 10:21:29 10:26:27 10:30 34 D-E 94
09Feb94 11:56:26 12:01:31 12:06 63 D-W 95
09Feb94 13:31:47 13:35:48 13:39 10 D-W 96

10Feb94 04:29:47 04:33:23 04:36 7 A-E 106
10Feb94 06:02:39 06:07:37 06:12 49 A-E 107
10Feb94 07:37:37 07:42:35 07:47 38 A-W 108
10Feb94 09:13:06 09:17:59 09:22 28 D-E 109
10Feb94 10:48:13 10:53:18 10:57 58 D-E 110
10Feb94 12:23:12 12:27:59 12:32 24 D-W 111

11Feb94 04:55:01 04:59:37 05:03 20 A-E 122
11Feb94 06:29:14 06:34:15 06:38 68 A-W 123
11Feb94 08:04:37 08:09:29 08:13 28 D-W 124
11Feb94 09:39:57 09:44:55 09:49 35 D-E 125
11Feb94 11:14:54 11:19:58 11:24 61 D-W 126
11Feb94 12:50:16 12:54:15 12:57 9 D-W 127

Paris, France STS-60 Element Set GSFC-005

```
date rise tca set el geo orbit

08Feb94 05:11:00 05:14:59 05:18 10 A-E 75
08Feb94 06:44:21 06:49:21 06:53 71 A-E 76
08Feb94 08:19:34 08:24:27 08:28 29 A-W 77
08Feb94 09:55:09 09:59:57 10:04 24 D-E 78
08Feb94 11:30:15 11:35:19 11:39 54 D-E 79
08Feb94 13:05:15 13:10:00 13:14 23 D-W 80

09Feb94 05:36:32 05:41:17 05:45 26 A-E 91
09Feb94 07:11:03 07:16:03 07:20 49 A-W 92
09Feb94 08:46:37 08:51:25 08:55 23 D-W 93
09Feb94 10:21:59 10:26:56 10:31 31 D-E 94
09Feb94 11:56:56 12:02:00 12:06 61 D-W 95
09Feb94 13:32:23 13:36:16 13:39 9 D-W 96

10Feb94 04:29:25 04:33:25 04:36 10 A-E 106
10Feb94 06:02:48 06:07:49 06:12 73 A-E 107
10Feb94 07:38:02 07:42:55 07:47 29 A-W 108
10Feb94 09:13:36 09:18:25 09:22 24 D-E 109
10Feb94 10:48:42 10:53:47 10:58 56 D-E 110
10Feb94 12:23:42 12:28:27 12:32 22 D-W 111

11Feb94 04:54:58 04:59:44 05:03 27 A-E 122
11Feb94 06:29:31 06:34:31 06:39 48 A-W 123
11Feb94 08:05:06 08:09:53 08:14 23 D-W 124
11Feb94 09:40:27 09:45:23 09:49 31 D-E 125
11Feb94 11:15:23 11:20:27 11:25 59 D-W 126
11Feb94 12:50:53 12:54:42 12:58 8 D-W 127

Tokyo, Japan STS-60 Element Set GSFC-005

date rise tca set el geo orbit

08Feb94 03:58:11 04:03:04 04:07 28 D-E 74
08Feb94 05:33:22 05:37:42 05:41 14 D-W 75
08Feb94 18:50:25 18:54:16 18:57 9 A-E 84
08Feb94 20:23:54 20:28:47 20:33 41 A-W 85

09Feb94 02:50:26 02:54:34 02:58 10 D-E 89
09Feb94 04:24:44 04:29:45 04:34 59 D-W 90
09Feb94 19:15:48 19:20:38 19:24 38 A-E 100
09Feb94 20:51:23 20:55:39 20:59 13 A-W 101

10Feb94 03:16:38 03:21:32 03:25 29 D-E 105
10Feb94 04:51:50 04:56:09 04:59 13 D-W 106
10Feb94 18:08:50 18:12:42 18:16 9 A-E 115
10Feb94 19:42:22 19:47:15 19:51 39 A-W 116

11Feb94 02:08:52 02:13:02 02:16 10 D-E 120
11Feb94 03:43:11 03:48:12 03:52 56 D-W 121
11Feb94 18:34:14 18:39:05 18:43 41 A-E 131
11Feb94 20:09:54 20:14:07 20:17 12 A-W 132

Sydney, Australia STS-60 Element Set GSFC-005
```

```
date rise tca set el geo orbit

08Feb94 07:24:27 07:29:22 07:33 73 D-W 76
08Feb94 09:01:23 09:04:43 09:07 6 D-W 77
08Feb94 15:26:04 15:30:58 15:35 44 A-E 81
08Feb94 17:01:48 17:05:25 17:08 7 A-W 82

09Feb94 06:16:45 06:21:18 06:25 21 D-E 91
09Feb94 07:51:38 07:56:07 08:00 17 D-W 92
09Feb94 14:18:17 14:22:34 14:26 13 A-E 96
09Feb94 15:52:45 15:57:32 16:01 31 A-W 97

10Feb94 06:42:54 06:47:50 06:52 69 D-W 107
10Feb94 08:19:53 08:23:12 08:26 5 D-W 108
10Feb94 14:44:31 14:49:26 14:53 47 A-E 112
10Feb94 16:20:18 16:23:51 16:26 7 A-W 113

11Feb94 05:35:09 05:39:45 05:43 22 D-E 122
11Feb94 07:10:09 07:14:35 07:18 16 D-W 123
11Feb94 13:36:43 13:41:03 13:44 13 A-E 127
11Feb94 15:11:14 15:15:59 15:20 29 A-W 128

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
```

203. Daily IPS Report - 8 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 09:59:25 UTC
From: dave@eram.esi.com.au
Message-ID: <5172@eram.esi.com.au>
Source record: 28057
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 7 February 1994
Summary for 7 February and Forecast up to 10 February
IPS Warning 03 was issued on 03 Feb and is current
for interval 7-11 Feb.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 096/043

1B. SOLAR FORECAST
08 February 09 February 10 February
Activity Very low Very low Very low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 097/044

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : storm levels during local night.

Estimated Indices : A K Observed A Index 6 February
Learmonth 37 4436 6443
Fredericksburg 43 39
Planetary 65 57

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
08 Feb 25 Active to minor storm.
09 Feb 20 Active.
10 Feb 20 Active.

2C. MAGNETIC COMMENT
Coronal hole induced magnetic activity continues.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
07 Feb fair-normal fair-normal poor-fair

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
08 Feb fair poor poor
09 Feb normal fair poor
10 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Magnetic activity continues to degrade HF comms at high
and mid lats.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 10 to 30% below predicted monthly values

T index: -31

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
08 Feb 0 About 20% below predicted monthly values.
09 Feb 20 About 15% below predicted monthly values.
10 Feb 40 About 10% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
HF comms were degraded on the 7th due to continuing magnetic
activity. Degraded comms are expected until the 11th.
Conditions should be improve slightly later today.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

204. shutle frequencies.

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 15:39:41 UTC
From: dave.champagne@takeone.com
Message-ID: <940208230704545@takeone.com>
Source record: 28058

Can anyone please tell me where I might find the space shutle on HF or on 2M or 70cm. I have found the shutle at 7.185 & 3.860 but it is not to dependable on those freq,s. So if you can help PLEASE DO. and 73. Thanks for reading this message. Dave. VE3QQQ/VE2QQQ/VE3CGK.

205. GPS Information Sources (Revised 5 February 1994)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 16:18:17 UTC
From: lang@unb.ca
Message-ID: <ID5333.D940208.T121329.lang@unb.ca>
Source record: 28059
Cross-posted to: comp.infosystems.gis,rec.aviation.misc,rec.boats,rec.radio.amateur.space

```
GPS INFORMATION SOURCES
=======================
| (Revised 5 February 1994; revisions since previous update marked with bar '|')

Prepared by

Richard B. Langley
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Comments and additions to this document are welcome.

1. OFFICIAL CIVILIAN INFORMATION SOURCE
---------------------------------------

GPS INFORMATION CENTER
o Official U.S. Gov't. point of contact for civilian users
o Operated by U.S. Coast Guard
o Voice telephone recording for constellation status: (703) 313-5907
o Computer bulletin board: (703) 313-5910 (up to 14,400
bps) - almanacs, general information, etc.
Available via the Internet through the FedWorld BBS gateway system. Telnet
to fedworld.gov and from the top menu, type DD54 to connect to the GPSIC
BBS. See file GPSIC.VIA.INTERNET.INFO in the CANSPACE file archives (see
below) for more information.
o 24 hour watchstand personnel: (703) 313-5900; fax: (703) 313-5920
o WWV / WWVH shortwave broadcasts - constellation status
o DMA and USCG notices and broadcasts

2. ELECTRONIC INFORMATION SERVICES
----------------------------------

UNITED STATES NAVAL OBSERVATORY
o Responsible for monitoring behaviour of satellite clocks
o Clock data and general information on GPS available
from Automated Data Service (BBS): (202) 653-0155,
-0068, and -1079 (all bit rates); also available via the
Internet (192.5.41.239; anonymous ftp permitted; for telnet
```

connection, log in as ads -- a password is required -- GPS users may
contact Francine Vannicola, fmv@tycho.usno.navy.mil, for the password);
files also available via automated e-mail -- contact Francine Vannicola
for information
o USNO Series 4 mailed weekly bulletins contain satellite
clock info

INTERNATIONAL EARTH ROTATION SERVICE
o System maintained by IERS Central Bureau in Paris
o Earth orientation data from very long baseline interferometry,
laser ranging, and GPS observations
o Sets of space geodesy station coordinates
o UTC leap second announcements
o Access via anonymous ftp: mesiom.obspm.circe.fr (130.84.200.6)

2D SPACE OPERATIONS SQUADRON BBS
o Operated by U.S. Air Force 2d Space Operations Squadron, Falcon AFB, CO
o Service for GPS users from DoD, other U.S. GovUt. agencies, NATO, GovUt.
contractors
o Almanacs, NANUs, Operational Advisories
o DSN 560-6379; (719) 550-6379 (up to 2400 bps; N-8-1)

USAF GPS BBS AT HOLLOMAN AFB, NM
o Operated by U.S. Air Force 6585th Test Group; formerly at Yuma
o Daily almanac, observed range errors, tracking data
o (505) 679-1525 (variety of bit rates)

U.S. ARMY ELECTRONIC PROVING GROUND EGRIS BBS
o Operated by U.S Army
o NANUs, almanac and ephemeris data
o (602) 538-3818 (300 and 1200 bps); (602) 538-3856 (9600 bps)

UNITED KINGDOM CIVIL SATELLITE GROUP ELECTRONIC BBS
o Operated by the University of Nottingham for the Royal Institution of
Navigation
o Full access is only available to members of UKCSG
o +44-602-422111 (2400 bps)

GPSINFO ELECTRONIC VIDEOTEX BBS
o Operated by the Survey Department of Rijkswaterstaat, (the Dutch
Ministry of Transport and Public Works), Delft
o +31-15-561959 (1200 and 2400 bps)

GPS INFO ELECTRONIC BBS
o Operated by Statens Kartverk (the Norwegian Mapping Authority),
Honefoss.
o +47-321-24045 and -18369 (1200 and 2400 bps)

GLOBAL SATELLITE SOFTWARE BBS
o Operated by Global Satellite Software, Inc., San Jose, California
o (408) 252-7358 (300 / 1200 / 2400 bps)

| GIBS - GPS INFORMATIONS- UND BEOBACHTUNGSSYSTEM (INFORMATION AND OBSERVATION
| SYSTEM)
| o Operated by Institut fuer Angewandte Geodasie, Frankfurt/M, Germany
| o +49-69-6333-379 and -418 (up to 19200 bps)
| o Available via Internet: Telnet to no5.ifag.de (141.74.240.25)
| o A GPS status report in German is available at +49 341 5634-380. The
| report is updated at the beginning of each working day.
| o Further information from gibs@no5.ifag.de

GRINEL - PROFESSIONAL ELECTRONICS BBS
o Verwoerdburg, South Africa
| o Operated by Grinel Professional Services on behalf of the Southern Africa
| GPS User Group
o Status advisories, almanac
o +27-12-663-2583 (300 to 2400 bps)
| o According to a report from South Africa dated 4 October 1993, this BBS is
| no longer active

KORT- OG MATRIKELSTYRELSEN BBS
o Kobenhavn, Denmark
o +45-3-185-3541 (up to 2400 bps)

ASSOCIATED CONSULTING INC. BBS
o Las Vegas, Nevada, U.S.A.
o (702) 647-9266 (300/1200/2400 bps)

NATIONAL LAND SURVEY BBS
o Gavle, Sweden
o +46-26-153748 (up to 19200 bps)

AUSLIG GEODESY ELECTRONIC BBS
o Operated by Australian Surveying and Land Information Group
o Constellation status, almanac data, related geodetic information
o +61-6-201-4375 or -4378 (300 to 600 bps)

CANADIAN SPACE GEODESY FORUM
o A LISTSERV-based discussion and information electronic mailing list
o Address of list: CANSPACE@UNB.CA
o Address for further information: LANG@UNB.CA
o File archive in "directory" PUB.CANSPACE on unbmvs1.csd.unb.ca
(131.202.1.2) available by anonymous ftp
| o File archive also available via Gopher;
| URL: gopher://unbmvs1.csd.unb.ca:1570/1EXEC%3aCANSPACE
o Latest DoD NANUs may be obtained by "fingering" gps@geomac.se.unb.ca

OTHER GPS MAILING LISTS
o GPS DIGEST
Moderated by Andy Arkusinski and Ken Jongsma of Smiths Industries, Grand
Rapids, MI.

According to the moderators ...
The GPS Digest is a forum for the discussion of topics related to the USAF
Global Positioning System (GPS) and other satellite navigation positioning
systems. The GPS Digest is moderated and is not presently available via

USENET newsgroup. Submissions should be made to gps@tws4.si.com.
Administrative requests [including requests to be added to the mailing
list] should be made to gps-request@tws4.si.com.
The digests are archived in the CANSPACE file archives.

o GPStech
The GPStech Mailing List
Operated by Jeff Freymueller, Stanford University

Jeff Freymueller has begun an unmoderated mailing list for the discussion
of GPS technical and other issues. The intention is to provide a forum for
the exchange of information, for discussion of the finer technical points
that always seem to trip us up, and for questions about particular GPS
analysis software.

GPStech is intended to be primarily for discussions and
question-and-answer. Hopefully there will soon be several list members who
are experienced with each of the commonly-used software systems, so that
questions can be answered. Any message sent to the list account is
immediately sent out to all members of the list. All messages will be
automatically archived in daily files.

Use the following mail addresses to access the GPStech list:

gpstech@cotopaxi.stanford.edu -- to post a message
gpstech-request@cotopaxi.stanford.edu -- to join or quit the list

USENET
Several USENET news groups have occasional postings related to GPS. Among
them are
o comp.infosystems.gis (gatewayed with the LISTSERV list
GIS-L@UBVM.CC.BUFFALO.EDU)
o rec.aviation.misc
o rec.boats
o sci.space
o sci.space.news
| A new USENET news group, sci.geo.satnav, is in the process of being
| established.

3. PERIODICALS

GPS WORLD MAGAZINE
o Monthly magazine covering the spectrum of GPS usage
| o Current regular subscription rates: US $59, Canada $79, Foreign $117
| o Special subscription rates may be offered from time to time
| o Free subscriptions may still be available for qualified individuals
o Advanstar Communications
P.O. Box 10460
Eugene, Oregon 97440-2460
U.S.A.
Phone: (503) 343-1200
| Fax: (503) 683-8841

Telex: 510-597-0365

GPS WORLD NEWSLETTER
o 6-page newsletter published twice a month by Advanstar Communications
o For subscription information, contact GPS World at the address and phone numbers above

GPS REPORT
o 8-page newsletter containing news and analysis on commercial and military applications of GPS
o Also available electronically via NewsNet and Predicasts
o Phillips Business Information, Inc.
7811 Montrose Road
Potomac, MD 20854
U.S.A.
Phone: (301) 340-2100
Fax: (301) 424-4297
Telex: 358149

CSTG GPS SUBCOMMISSION'S GPS BULLETIN
o Bulletin of the GPS Subcommission under Commission VIII, International Coordination of Space Techniques for Geodesy and Geodynamics of the International Association of Geodesy and the International Union of Geodesy and Geophysics
o Reports on GPS developments related to high accuracy uses of GPS
o Status of the Cooperative International GPS Network (CIGNET)
o GPS Bulletin is prepared and distributed by the National Geodetic Survey, National Oceanic and Atmospheric Administration, U.S. Department of Commerce
o Editor: Miranda Chin
NOAA, N/OES13
1305 East-West Highway
Silver Springs, MD 20910
Phone: (301)713-2852
Fax: (301) 713-4475
e-mail: miranda@gracie.grdl.noaa.gov
| o According to a report received on 9 November 1993, the GPS Bulletin is no
| longer being published.

| GNSS UPDATE
| o Irregular publication of Transport Canada's Global Navigation Satellite
| System Working Group
| o Editor: Deborah Martin
| Transport Canada
| Place de Ville, Tower "C"
| Ottawa, Ontario
| K1A 0N8
| Attention: AANDDB
| Fax: (613) 998-7416

| SATNAV NEWS
| o Quarterly publication on developments at the Federal Aviation

| Administration's Satellite Program Office
| o Available in electronic form from the CANSPACE file archives (see above)

4. BOOKS AND MONOGRAPHS

Ackroyd, N. and R. Lorimer (1990). Global Navigation, A GPS User's Guide. Lloyd's of London, 202 pp.

ARINC Research Corporation (1991). System Specifications for Navstar GPS Space Segment/Navigation Users Interface. GPS Interface Control Document. ICD-GPS-200, 3 July, 115 pp.

Hofmann-Wellenhof, B., H. Lichtenegger, and J. Collins (1992). Global Positioning System, Theory and Practice. Springer-Verlag, 326 pp.

Institute of Navigation, The (1980). Global Positioning System. Vol. I. Collected reprints of papers published in Navigation. The Institute of Navigation (U.S.), 246 pp.

Institute of Navigation, The (1984). Global Positioning System. Vol. II. Collected reprints of papers published in Navigation. The Institute of Navigation (U.S.), 257 pp.

Institute of Navigation, The (1986). Global Positioning System. Vol. III. Collected reprints of papers published in Navigation. The Institute of Navigation (U.S.), 293 pp.

King, R.W., E.G. Masters, C. Rizos, A. Stolz, and J. Collins (1985). Surveying with GPS. Monograph 9. School of Surveying, The University of New South Wales, Kensington, New South Wales, Australia.

Leick, A. (1990). GPS Satellite Surveying. John Wiley and Sons, Inc., New York, Toronto, 352 pp.

Logsdon, T. (1992). Navstar Global Positioning System. Van Nostrand Reinhold, New York, 249 pp.

McElroy, S., E. Masters, G. Jones, D. Kinlyside, C. Rizos, A. Sivertsen, P. Brown, O. Moss, and G. Dickson (1992). Getting Started with GPS Surveying. The Global Positioning Consortium (GPSCO), c/o School of Surveying, The University of New South Wales, Kensington, New South Wales, Australia, 186 pp.

| Puterski, R., J.A. Carter, M.J. Hewitt, H.F. Stone, L.T. Fisher, and E.T.
| Slonecker. (1992). GIS Technical Memorandum 3: Global Positioning Systems
| Technology and its Application in Environmental Programs. EPA/600/R-92/036.
| Environmental Monitoring Systems Laboratory, Office of Research and
| Development, U.S. Environmental Protection Agency, P.O. Box 93478, Las Vegas,
| NV 89193-3478, 68 pp.

Seeber, G. (1993). Satellite Geodesy: Foundations, Methods, and Applications. Revised translation of Satellitengeodasie. Walter de Gruyter & Co., Berlin, 531 pp.

Trimble Navigation, Ltd. (1989). GPS: A Guide to the Next Utility. Trimble Navigation Ltd., Sunnyvale, California., 76 pp.

Trimble Navigation, Ltd. (1992). GPS Surveyor's Field Guide -- A Field Guidebook for Static Surveying. Trimble Navigation Ltd., Sunnyvale, California.

Trimble Navigation, Ltd. (1992). GPS Surveyor's Field Guide -- A Field Guidebook for Dynamic Surveying. Trimble Navigation Ltd., Sunnyvale, California, 72 pp.

Trimble Navigation, Ltd. (1993). Differential GPS Explained -- An expose of the surprisingly simple principles behind today's most advanced positioning technology. Trimble Navigation Ltd., Sunnyvale, California, 55 pp.

Wells, D.E., N. Beck, D. Delikaraoglou, A. Kleusberg, E.J. Krakiwsky, G. Lachapelle, R.B. Langley, M. Nakiboglu, K.P. Schwarz, J.M. Tranquilla, and P. Vanicek (1987). Guide to GPS Positioning. 2nd printing with corrections. Canadian GPS Associates, Fredericton, New Brunswick, Canada, 600 pp.

Many of these books are available from

Navtech Book and Software Store (a division of Navtech Seminars, Inc.)
2775 S. Quincy St.
#610
Arlington, VA 22206-2204
U.S.A.
Phone: (800) 628-0885
(703) 931-0500
Fax: (703) 931-0503

| 5. PAPERS AND ARTICLES
| ----------------------
|
| A series of six articles on GPS receivers (primarily the transputer-based
| receivers developed by Inmos) by Philip Mattos, a consulting engineer with
| Inmos/SGS-Thomson, was published by Electronics World + Wireless World between
| December 1992 and May 1993. In addition to receiver details, the articles
| also cover the theory of operation of GPS, GPS antennas, and various GPS
| applications. Note that the constructional kit and newsletter mentioned in
| the sixth article are not available and that there are some minor errors here
| and there scattered through the articles.
|
| Mattos, P. (1992). GPS. Electronics World & Wireless World, No. 1681, pp.
| 982-987.
|
| Mattos, P. (1993). GPS 2: Receiver Architecture. Electronics World &
| Wireless World, No. 1682, pp. 29-32.
|
| Mattos, P. (1993). GPS 3: The GPS Message On The Hardware Platform.
| Electronics World & Wireless World, No. 1683, pp. 146-151.
|
| Mattos, P. (1993). GPS 4: Radio Architecture. Electronics World & Wireless

| World, No. 1684, pp. 210-216.
|
| Mattos, P. (1993). GPS 5: The Software Engine. Electronics World & Wireless
| World, No. 1685, pp. 296-&.
|
| Mattos, P. (1993). GPS 6: Applications. Electronics World & Wireless World,
| No. 1686, pp. 384-389.

| 6. GPS BIBLIOGRAPHY

A GPS Bibliographic Subscription Service is offered by Canadian GPS Associates, publishers of the Guide to GPS Positioning. This service provides twice-yearly updated editions, listing GPS-related publications from journals, newsletters, reports, and proceedings of GPS-related conferences.

The Premier Edition, issued in late 1992, contained 4,358 entries. This grew from a 1,000-entry bibliography prepared in 1989 at the University of New Brunswick for the U.S. Army Corps of Engineers (Dredging Research Program Technical Report DRP-92-2, available in electronic form as message #5296 on the U.S. Coast Guard's GPS Information Center Bulletin Board). At 8,802 entries, the July 1993 Edition has doubled in size.

The GPS Bibliography is available in both hard-copy and computer-readable form on PC or Macintosh diskettes. The PC diskette version is available in either the standard CSV (comma-separated-variables) text format, or dBase III format. For Macintosh users, the format is tab-separated field text format.

For further information, contact

Canadian GPS Associates
P.O. Box 3184
Postal Station B
Fredericton, New Brunswick
Canada E3A 5G9
Phone: (506) 454-2650
Fax: (506) 454-0352
e-mail: lang@unb.ca

| 7. GPS RECEIVER SURVEYS

GPS Receiver Survey. Published by Navtech Seminars, Inc. (see above for address). Updated frequently.

GPS World Receiver Survey. Published annually in the January issue of GPS World magazine.

| Guide to GPS Receivers. Published irregularly by Colwell-Kirtland
| International, 675 Almanor Avenue, Sunnyvale, CA 94086; (408) 720-0111.

Who's Who in GPS Equipment -- A Technical Reference. Published by Phillips Business Information, Inc., publishers of GPS Report (see above for address). Annual publication.

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University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
==========

206. Newbie questions on RS-12

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 16:36:37 UTC
From: karayan@blitzen.cc.bellcore.com
Message-ID: <2j8f2l$gku@blitzen.cc.bellcore.com>
Source record: 28060

Hi! I'm relatively new to ham radio and I'd like to get my hands wet with sats. Since I am a dedicated HF CW fan, I'd like to try the RS-12 sat first. I got very excited when I saw the article in QST about working RS-12. However, the article doesn't get into any kind of detail in terms of the required setup. Sooooo, here are my questions:

1. Is it realistic to work the RS-12 CW robot, or work THROUGH the sat (as a repeater) with a plain dipole? I will have to use the robot up/downlink pair (since I'm a mere tech+) if it matters.

2. Just how strong is the downlink signal? I eagerly searched and searched for the beacon signal (29408+/-) last night, but couldn't hear a thing. (I used my trusty Sony 2010 with a whip, if it matters)

3. Any experiences working the 15m up/ 10m down of the RS-12 sat? Do you HAVE to have megarigs/megayagis? (Or, equivalently: Is there ANY niche in ham radio I can get into without much $$$? ;-) ;-)

4. HOW do I call CQ satellite on CW? Do I send "CQ SAT DE....." or something?

Thanks in advance.

George Karayannopoulos N2OWO
karayan@cc.bellcore.com Bellcore, Red Bank, NJ
Disclaimer: The opinions expressed here are mine and not my employer's.

--

George Karayannopoulos N2OWO
karayan@cc.bellcore.com Bellcore, Red Bank, NJ
Disclaimer: The opinions expressed here are mine and not my employer's.

207. INMARSAT-B service provider

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 17:45:23 UTC
From: mph469@nof.abdn.ac.uk
Message-ID: <2j8j3j$3iu@nof.abdn.ac.uk>
Source record: 28111

NMARSAT-B space segment service provider needed urgently.
Please advice.

Sooriyajeevan

208. ANS Bulletin 039.01 AO-13 OPERATIONS NET SCHEDS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 19:27:54 UTC
From: Bill Tynan <70323.2750@CompuServe.COM>
Message-ID: <$ans-039.01.1994@ampr.org>
Source record: 28112
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-039.01
AO-13 OPERATIONS NET SCHEDS

HR AMSAT NEWS SERVICE BULLETIN 039.01 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 8, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-039.01

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

12-Feb-94 2200 B 063 W9ODI VE2LVC
20-Feb-94 0200 B 070 WA5ZIB W5IU
28-Feb-94 0430 B 068 WB6LLO W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

/EX

209. VITA satellite info WANTED

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 22:42:49 UTC
From: clark@kiwi.gen.nz
Message-ID: <81769.389415290@kiwi.gen.nz>
Source record: 28113

Hello, has anyone heard of or have any information pertaining to the `Vita' satellite? Where would one look to find out as much as one can about `it'?

Is there any S/W out there (pref C code) for tracking such beasties? I believe that it has a polar orbit.

Any _any_ ANY information gratefully received (or pointers to more appropriate newsgroups).

Many thanks... clark
--
Domain: clark@kiwi.gen.nz ----------------------------+-------------------+
Voice : 64-25-935002 Disclaimer: All errors are | $ nice -20 work & |
Fax : 64-9-8494282 line niose! | $ exec games |
Snail : PO Box 47-195, Ponsonby, Auckland, New Zealand +-------------------+

210. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 23:42:14 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.760750934@afit.af.mil>
Source record: 28114

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 60
1 22977U 94006A 94038.97916667 .00000289 00000-0 64881-5 0 106
2 22977 56.9858 196.0115 0009202 273.8028 224.7106 15.72346142 700
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

211. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-02-08 23:42:30 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.760750950@afit.af.mil>
Source record: 28115
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 60
1 22977U 94006A 94038.97916667 .00000289 00000-0 64881-5 0 106
2 22977 56.9858 196.0115 0009202 273.8028 224.7106 15.72346142 700
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

212. SAREX Update for Feb 9 at 3:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-02-09 04:04:45 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-060.014.1994@ampr.org>
Source record: 28116
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-60.014
SAREX Update Feb. 9 at 03:30 UTC

Three of the five school groups slated for STS-60 have now made successful contacts. The most recent success was with the Mars Middle School, in Mars, Pennsylvania. They contacted the Discovery astronauts through a Telebridge in Texas on orbit number 85. The contact was initiated by Cosmonaut/Shuttle Mission Specialist Sergei Krikalev, U5MIR. Jan Davis then joined in on the school group discussion. A total of 9 students were able to ask questions.

Please note one correction from SAREX bulletin, SB008, regarding the SAREX contact between Sergei, U5MIR, and the school group at the House of Science and Technology for Youth in Moscow, Russia. The Cosmonaut who initiated the contact with Sergei was Musa Manarov, U2MIR. Sorry about the error.

School groups interested in communicating with the Shuttle astronauts are reminded to submit an application and proposal to the ARRL to be considered for a future contact. Final SAREX school group selections are decided approximately 6 months prior to the mission launch date. For more information, please write:

Educational Activities Division
ARRL
225 Main St
Newington, CT 06111

School groups are always welcome to listen into a school group contact when a telebridge contact occurs. We had several schools listening to the Mars, PA contact. For more details on how to listen in through the telebridge, please contact the ARRL at the above address or Frank Bauer, KA3HDO of AMSAT. His e-mail address is ka3hdo@amsat.org

The official SAREX element set for today will be GSFC-011. This element sent was generated by Ron Parise, WA4SIR of the Goddard Space Flight Center. Gil Carman, WA5NOM reports that the predictions using GSFC-011 differed from GSFC-009 by approximately 2 seconds.

STS-60
1 22977U 94006A 94 39.59046866 0.00000351 00000-0 69389-5 0 119
2 22977 56.9887 193.2605 0009224 272.9504 87.0508 15.72376812 813

Satellite: STS-60
Catalog number: 22977
Epoch time: 94039.59046866 (08 FEB 94 14:10:16.49 UTC)

Element set: GSFC-011
Inclination: 56.9887 deg
RA of node: 193.2605 deg Space Shuttle Flight STS-60
Eccentricity: 0.0009224 Keplerian Elements
Arg of perigee: 272.9504 deg
Mean anomaly: 87.0508 deg
Mean motion: 15.72376812 rev/day Semi-major Axis: 6730.2383 Km
Decay rate: 0.35E-05 rev/day*2 Apogee Alt: 358.06 Km
Epoch rev: 81 Perigee Alt: 345.64 Km

NOTE - This element set is based on NORAD element set # 011.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

213. Help with Instant Track V1.00b

Newsgroup: rec.radio.amateur.space
Date: 1994-02-09 04:28:49 UTC
From: thompson@cactus.org
Message-ID: <1994Feb9.042849.1094@cactus.org>
Source record: 28117

I'm having trouble with the NASA 2-line element sets
when I try to update the elements in Instant Track V1.00b.

I have a patch I installed about 2 years ago to correct
for the + sign/checksum problem.

Have there been any changes in the NORAD format in the last
2 years? Something appears to be different.

Thanks in advance,

Charlie Thompson
Austin, Tx.

214. Daily IPS Report - 9 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-09 06:11:13 UTC
From: dave@eram.esi.com.au
Message-ID: <5173@eram.esi.com.au>
Source record: 28118
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 8 February 1994
Summary for 8 February and Forecast up to 11 February
IPS Warning 03 was issued on 03 Feb and is current
until Feb 11.

1A. SOLAR SUMMARY
Activity: Very Low

Flares: None.

Observed 10.7 cm flux/Equivalent Sunspot Number : 095/41

1B. SOLAR FORECAST
09 February 10 February 11 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 097/44

1C. SOLAR COMMENT
Previously flaring (M Class) region due to return on 10th February.
This region was declining in area when it rotated from view, but
was still magnetically complex as it transited the west limb.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : active to minor storm

Estimated Indices : A K Observed A Index 7 February
Learmonth 29 4445 4452
Fredericksburg 35 45
Planetary 47 54

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
09 Feb 20 Active.
10 Feb 18 Unsettled to active.
11 Feb 16 Unsettled to active.

2C. MAGNETIC COMMENT
Active periods expected over next three days as coronal hole
disturbance continues.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
08 Feb fair-normal fair poor-fair
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
09 Feb normal fair poor
10 Feb normal fair poor
11 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 10 to 30% below predicted monthly values

T index: -24

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
09 Feb 10 10 to 15% below predicted monthly values.
10 Feb 20 10 to 15% below predicted monthly values.
11 Feb 40 10 to 15% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded HF comms conditions were observed yesterday. Conditions
should be marginally better today.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

215. Daily IPS Report - 10 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-10 04:46:27 UTC
From: dave@eram.esi.com.au
Message-ID: <5174@eram.esi.com.au>
Source record: 28119
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 9 February 1994
Summary for 9 February and Forecast up to 12 February
IPS Warning 03 was issued on 03 Feb and is current
until Feb 11.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 101/049

1B. SOLAR FORECAST
10 February 11 February 12 February
Activity Low Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 103/052

1C. SOLAR COMMENT
Previously flaring region (M class) due to return on 10th February.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : active to minor storm levels
observed during local night.

Estimated Indices : A K Observed A Index 8 February
Learmonth 26 3335 4543
Fredericksburg 24 42
Planetary 30 56

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
10 Feb 20 Unsettled to active.
11 Feb 20 Unsettled to active.
12 Feb 20 Unsettled.

2C. MAGNETIC COMMENT
Magnetic activity should decline over the next couple of days.
Another recurrent disturbance is expected Feb 14-15. This
disturbance is not expected to be as strong as recent activity.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
09 Feb fair-normal fair-normal poor-fair
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
10 Feb normal fair poor
11 Feb normal fair poor
12 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Propagation conditions should improve over the next few
days. Another disturbed interval expected Feb 14-16.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were depressed 20-30% 00-02UT then recovering to near
predicted values.

T index: 21

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
10 Feb 25 Near predicted monthly values.
11 Feb 30 Near predicted monthly values.
12 Feb 30 Near predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Depressions can be expected early on the 10th, however
ionospheric conditions should continue to improve throughout today.
Another disturbed period is expected Feb 14-16.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

216. STS-60 Element Set (94041.688)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-10 10:30:38 UTC
From: elements-request@alsys.com
Message-ID: <STS-60.94041.688@alsys.com>
Source record: 28120
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-60
1 22977U 94006A 94041.68880588 .00001098 -91503-7 80760-5 0 143
2 22977 56.9892 183.8290 0006683 303.1211 56.9216 15.71605210 1146

Satellite: STS-60
Catalog number: 22977
Epoch time: 94041.68880588 = (10 FEB 94 16:31:52.82 UTC)
Element set: 014
Inclination: 56.9892 deg
RA of node: 183.8290 deg Space Shuttle Flight STS-60
Eccentricity: .0006683 Keplerian Element set JSC-014
Arg of perigee: 303.1211 deg from NASA flight Day 8 vector
Mean anomaly: 56.9216 deg
Mean motion: 15.71605210 rev/day G. L. Carman
Decay rate: 1.098e-05 rev/day^2 NASA Johnson Space Center
Epoch rev: 114

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris KK6YB Internet: elements-request@alsys.com
San Diego, CA, USA Phone: +1 619-457-2700
```

217. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-02-10 22:31:16 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.760919476@afit.af.mil>
Source record: 28121

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 60
1 22977U 94006A 94041.25000000 .00000417 00000-0 75807-5 0 154
2 22977 56.9879 185.8034 0006879 304.3677 92.0407 15.71677067 1068
1994006J
1 22998U 94006J 94040.80785293 -.00000585 00000-0 00000+0 0 10
2 22998 56.9859 187.7896 0008776 293.9389 119.8855 15.72168613 19
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

218. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-02-10 22:31:32 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.760919492@afit.af.mil>
Source record: 28122
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

```
STS 60
1 22977U 94006A 94041.25000000 .00000417 00000-0 75807-5 0 154
2 22977 56.9879 185.8034 0006879 304.3677 92.0407 15.71677067 1068
1994006J
1 22998U 94006J 94040.80785293 -.00000585 00000-0 00000+0 0 10
2 22998 56.9859 187.7896 0008776 293.9389 119.8855 15.72168613 19
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

219. Daily IPS Report - 11 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-10 23:29:33 UTC
From: dave@eram.esi.com.au
Message-ID: <5178@eram.esi.com.au>
Source record: 28123
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 10 February 1994
Summary for 10 February and Forecast up to 13 February
IPS Warning 03 was issued on 03 Feb and expires today.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 094/040

1B. SOLAR FORECAST
11 February 12 February 13 February
Activity Low Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 090/034

1C. SOLAR COMMENT
Previously flaring region (M class) has yet to appear.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : ???

Estimated Indices : A K Observed A Index 9 February
Learmonth 21 3333 5442
Fredericksburg 27 32
Planetary 30 34

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
11 Feb 20 Active.
12 Feb 20 Active.
13 Feb 20 Active.

2C. MAGNETIC COMMENT
Magnetic activity did not decline as expected, futher active periods
are now expected. Another recurrent disturbance is expected Feb
14-15.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

10 Feb fair-normal fair-normal poor-fair
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
11 Feb normal fair poor
12 Feb normal fair poor
13 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Propagation conditions are now expected to remain fair for
mid lats and fair-poor at high lats until Feb 16.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were about 15% below predicted monthly values

T index: -4

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
11 Feb 10 10 to 15% below predicted monthly values.
12 Feb 20 About 10% below predicted monthly values.
13 Feb 20 About 10% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Ionosphere did not recover as expected yesterday, probably due
to continuing magnetic activity. Another disturbed period is
expected Feb 14-16.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

220. Weekly IPS Report - 11 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-10 23:30:14 UTC
From: dave@eram.esi.com.au
Message-ID: <5179@eram.esi.com.au>
Source record: 28124
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

4 FEBRUARY - 10 FEBRUARY 1994

Issue No 06
Date of issue: 11 February, 1994

INDICES:
Date 04 05 06 07 08 09 10
10cm 095 093 095 096 095 101 094
A 10 21 39 45 42 32 (27)
T 43 50 -4 -31 -24 21 -4

SUMMARY OF ACTIVITY

February 4
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was mostly quiet with
unsettled to active conditions 12-21UT.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values to 15% enhanced during local night.

February 5
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was mostly quiet to unsettled.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values to 30% enhanced during local night.

February 6
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was at storm levels.
Ionospheric F2 critical frequencies at Sydney were about 10-20% below
predicted monthly values

February 7
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was storm levels during local
night.
Ionospheric F2 critical frequencies at Sydney were 10 to 30% below
predicted monthly values.

.SK
February 8
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was at active to minor storm
levels.
Ionospheric F2 critical frequencies at Sydney were 10 to 30% below
predicted monthly values.

February 9
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was at active to minor storm
levels observed during local night.
Ionospheric F2 critical frequencies at Sydney were depressed
20-30% 00-02UT then recovering to near predicted values.

February 10
Solar activity was low.
The geomagnetic field at Learmonth (WA) was at active to minor
storm levels during local night.
Ionospheric F2 critical frequencies at Sydney were about 15% below
predicted monthly values.

Comment:
Strong magnetic storm activity was observed during Feb 6-8. This
activity arrived a day earlier than expected and was stronger
than expected. Storm was due to a coronal hole.

FORECAST FOR THE NEXT WEEK (11 - 17 FEBRUARY)

SOLAR: low to moderate

GEOMAGNETIC: active due to coronal hole.

IONOSPHERIC: degraded HF communications expected all week.
MUFs are expected to be 10-15% depressed on IPS predicted
monthly values.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

221. STS Downlink

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 00:10:59 UTC
From: dwetzel@rain.com
Message-ID: <2jeije$r98@rain.psg.com>
Source record: 28125

Does anyone happen to have the actual unified S-Band downlink or TDRS freqs
from the Shuttle?

Thanks!

dwetzel@rain.com

222. ORBS$042.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 13:47:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-042.o.1994@ampr.org>
Source record: 28126
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-042.O
Orbital Elements 042.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SAT
FROM WA5QGD FORT WORTH,TX February 11, 1994
BID: $ORBS-042.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94040.06708801
Element set: 260
Inclination: 27.2057 deg
RA of node: 342.5166 deg
Eccentricity: 0.6022455
Arg of perigee: 153.1354 deg
Mean anomaly: 258.3191 deg
Mean motion: 2.05877972 rev/day
Decay rate: -1.48e-06 rev/day^2
Epoch rev: 8014
Checksum: 282

Satellite: UO-11
Catalog number: 14781
Epoch time: 94040.53052044
Element set: 663
Inclination: 97.7907 deg
RA of node: 61.1932 deg
Eccentricity: 0.0011408
Arg of perigee: 323.9974 deg
Mean anomaly: 36.0464 deg
Mean motion: 14.69140692 rev/day
Decay rate: 3.22e-06 rev/day^2
Epoch rev: 53156
Checksum: 292

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94040.55124186
Element set: 860
Inclination: 82.9210 deg
RA of node: 63.1886 deg
Eccentricity: 0.0012804
Arg of perigee: 25.2124 deg
```

Mean anomaly: 334.9655 deg
Mean motion: 13.72330924 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 33240
Checksum: 267

Satellite: AO-13
Catalog number: 19216
Epoch time: 94040.93964943
Element set: 875
Inclination: 57.8821 deg
RA of node: 268.9522 deg
Eccentricity: 0.7208878
Arg of perigee: 334.5703 deg
Mean anomaly: 3.1370 deg
Mean motion: 2.09717918 rev/day
Decay rate: 3.90e-06 rev/day^2
Epoch rev: 4334
Checksum: 331

Satellite: FO-20
Catalog number: 20480
Epoch time: 94035.98074861
Element set: 656
Inclination: 99.0184 deg
RA of node: 212.8744 deg
Eccentricity: 0.0540153
Arg of perigee: 279.0888 deg
Mean anomaly: 74.9498 deg
Mean motion: 12.83223693 rev/day
Decay rate: -2.2e-07 rev/day^2
Epoch rev: 18717
Checksum: 336

Satellite: AO-21
Catalog number: 21087
Epoch time: 94041.01003248
Element set: 423
Inclination: 82.9396 deg
RA of node: 236.8134 deg
Eccentricity: 0.0036944
Arg of perigee: 77.6411 deg
Mean anomaly: 282.8874 deg
Mean motion: 13.74533854 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 15211
Checksum: 298

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94040.58590730

Element set: 661
Inclination: 82.9204 deg
RA of node: 106.0890 deg
Eccentricity: 0.0030651
Arg of perigee: 102.2186 deg
Mean anomaly: 258.2406 deg
Mean motion: 13.74034795 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 15112
Checksum: 275

Satellite: ARSENE
Catalog number: 22654
Epoch time: 93338.80803910
Element set: 243
Inclination: 1.4104 deg
RA of node: 113.5274 deg
Eccentricity: 0.2936576
Arg of perigee: 161.9838 deg
Mean anomaly: 210.8642 deg
Mean motion: 1.42202044 rev/day
Decay rate: -8.7e-07 rev/day^2
Epoch rev: 299
Checksum: 278

/EX

223. ORBS$042.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 13:50:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-042.d.1994@ampr.org>
Source record: 28127
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-042.D
Orbital Elements 042.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX February 11, 1994
BID: $ORBS-042.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94037.22619383
Element set: 961
Inclination: 98.5971 deg
RA of node: 123.7526 deg
Eccentricity: 0.0010334
Arg of perigee: 214.1893 deg
Mean anomaly: 145.8624 deg
Mean motion: 14.29821595 rev/day
Decay rate: 7.7e-07 rev/day^2
Epoch rev: 21087
Checksum: 317

Satellite: AO-16
Catalog number: 20439
Epoch time: 94037.21681236
Element set: 762
Inclination: 98.6031 deg
RA of node: 124.8401 deg
Eccentricity: 0.0010724
Arg of perigee: 214.1741 deg
Mean anomaly: 145.8750 deg
Mean motion: 14.29877371 rev/day
Decay rate: 7.1e-07 rev/day^2
Epoch rev: 21088
Checksum: 290

Satellite: DO-17
Catalog number: 20440
Epoch time: 94040.75231196
Element set: 762
Inclination: 98.6061 deg
RA of node: 128.6181 deg
Eccentricity: 0.0010852
Arg of perigee: 203.0624 deg
```

Mean anomaly: 157.0068 deg
Mean motion: 14.30016024 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21140
Checksum: 247

Satellite: WO-18
Catalog number: 20441
Epoch time: 94037.22688753
Element set: 762
Inclination: 98.6048 deg
RA of node: 125.1409 deg
Eccentricity: 0.0011314
Arg of perigee: 214.6745 deg
Mean anomaly: 145.3695 deg
Mean motion: 14.29991649 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 21090
Checksum: 317

Satellite: LO-19
Catalog number: 20442
Epoch time: 94037.21376903
Element set: 761
Inclination: 98.6040 deg
RA of node: 125.3540 deg
Eccentricity: 0.0011701
Arg of perigee: 213.9496 deg
Mean anomaly: 146.0939 deg
Mean motion: 14.30085714 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 21091
Checksum: 279

Satellite: UO-22
Catalog number: 21575
Epoch time: 94040.70538846
Element set: 463
Inclination: 98.4469 deg
RA of node: 117.7141 deg
Eccentricity: 0.0007501
Arg of perigee: 318.1128 deg
Mean anomaly: 41.9484 deg
Mean motion: 14.36888785 rev/day
Decay rate: 8.5e-07 rev/day^2
Epoch rev: 13477
Checksum: 328

Satellite: KO-23
Catalog number: 22077
Epoch time: 94041.42783993

Element set: 358
Inclination: 66.0820 deg
RA of node: 185.3819 deg
Eccentricity: 0.0009572
Arg of perigee: 318.8321 deg
Mean anomaly: 41.1977 deg
Mean motion: 12.86284604 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7048
Checksum: 319

Satellite: AO-27
Catalog number: 22825
Epoch time: 94037.24428981
Element set: 259
Inclination: 98.6630 deg
RA of node: 114.3002 deg
Eccentricity: 0.0008288
Arg of perigee: 227.9109 deg
Mean anomaly: 132.1364 deg
Mean motion: 14.27605705 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 1900
Checksum: 292

Satellite: IO-26
Catalog number: 22826
Epoch time: 94037.72532850
Element set: 260
Inclination: 98.6651 deg
RA of node: 114.7973 deg
Eccentricity: 0.0008457
Arg of perigee: 230.9496 deg
Mean anomaly: 129.0928 deg
Mean motion: 14.27708094 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 1907
Checksum: 328

Satellite: KO-25
Catalog number: 22830
Epoch time: 94040.70815228
Element set: 262
Inclination: 98.5680 deg
RA of node: 116.3594 deg
Eccentricity: 0.0011136
Arg of perigee: 187.2116 deg
Mean anomaly: 172.8898 deg
Mean motion: 14.28032363 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 1950

```
Checksum: 298

/EX
```

224. ORBS$042.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 13:53:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-042.w.1994@ampr.org>
Source record: 28128
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-042.W
Orbital Elements 042.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SAT
FROM WA5QGD FORT WORTH,TX February 11, 1994
BID: $ORBS-042.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94040.90849396
Element set: 709
Inclination: 99.0697 deg
RA of node: 89.8019 deg
Eccentricity: 0.0014366
Arg of perigee: 217.1066 deg
Mean anomaly: 142.9114 deg
Mean motion: 14.13586894 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 47236
Checksum: 344

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94040.91622187
Element set: 607
Inclination: 98.5109 deg
RA of node: 53.7900 deg
Eccentricity: 0.0013419
Arg of perigee: 346.1037 deg
Mean anomaly: 13.9772 deg
Mean motion: 14.24863433 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 38448
Checksum: 313

Satellite: MET
Catalog number: 18820
Epoch time: 94040.41461213
Element set: 260
Inclination: 82.5397 deg
RA of node: 10.2207 deg
Eccentricity: 0.0016130
Arg of perigee: 174.2344 deg
```

Mean anomaly: 185.9005 deg
Mean motion: 13.84706640 rev/day
Decay rate: 7.4e-07 rev/day^2
Epoch rev: 30467
Checksum: 267

Satellite: MET
Catalog number: 19336
Epoch time: 94039.99790931
Element set: 262
Inclination: 82.5380 deg
RA of node: 54.3969 deg
Eccentricity: 0.0015730
Arg of perigee: 222.0779 deg
Mean anomaly: 137.9138 deg
Mean motion: 13.16964807 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26638
Checksum: 335

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94040.89310848
Element set: 513
Inclination: 99.1603 deg
RA of node: 26.7549 deg
Eccentricity: 0.0012242
Arg of perigee: 127.5055 deg
Mean anomaly: 232.7231 deg
Mean motion: 14.12957503 rev/day
Decay rate: 9.9e-07 rev/day^2
Epoch rev: 27724
Checksum: 293

Satellite: MET
Catalog number: 19851
Epoch time: 94040.58249263
Element set: 261
Inclination: 82.5181 deg
RA of node: 245.6465 deg
Eccentricity: 0.0012880
Arg of perigee: 224.0063 deg
Mean anomaly: 136.0047 deg
Mean motion: 13.84356993 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 25003
Checksum: 296

Satellite: MET
Catalog number: 20305
Epoch time: 94040.90489425

Element set: 982
Inclination: 82.5493 deg
RA of node: 357.9703 deg
Eccentricity: 0.0005714
Arg of perigee: 252.5364 deg
Mean anomaly: 107.5110 deg
Mean motion: 13.04423038 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 20630
Checksum: 275

Satellite: MET
Catalog number: 20670
Epoch time: 94040.79306496
Element set: 762
Inclination: 82.5504 deg
RA of node: 309.6649 deg
Eccentricity: 0.0016176
Arg of perigee: 139.0978 deg
Mean anomaly: 221.1403 deg
Mean motion: 13.84188455 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18299
Checksum: 328

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94041.23792391
Element set: 889
Inclination: 98.8429 deg
RA of node: 65.4112 deg
Eccentricity: 0.0014899
Arg of perigee: 8.2542 deg
Mean anomaly: 351.8867 deg
Mean motion: 14.01324157 rev/day
Decay rate: -2.56e-06 rev/day^2
Epoch rev: 17592
Checksum: 332

Satellite: MET
Catalog number: 20826
Epoch time: 94040.59762982
Element set: 761
Inclination: 82.5218 deg
RA of node: 247.4867 deg
Eccentricity: 0.0014958
Arg of perigee: 48.7238 deg
Mean anomaly: 311.5204 deg
Mean motion: 13.83572578 rev/day
Decay rate: 8.2e-07 rev/day^2
Epoch rev: 17011

Checksum: 320

Satellite: MET
Catalog number: 21232
Epoch time: 94040.56395652
Element set: 669
Inclination: 82.5392 deg
RA of node: 259.8160 deg
Eccentricity: 0.0013347
Arg of perigee: 141.0577 deg
Mean anomaly: 219.1526 deg
Mean motion: 13.16459526 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13456
Checksum: 303

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94039.95700562
Element set: 919
Inclination: 98.6320 deg
RA of node: 70.4809 deg
Eccentricity: 0.0012014
Arg of perigee: 247.6730 deg
Mean anomaly: 112.3172 deg
Mean motion: 14.22366100 rev/day
Decay rate: 1.36e-06 rev/day^2
Epoch rev: 14230
Checksum: 260

Satellite: MET
Catalog number: 21655
Epoch time: 94039.95480389
Element set: 665
Inclination: 82.5517 deg
RA of node: 207.2863 deg
Eccentricity: 0.0013312
Arg of perigee: 152.8840 deg
Mean anomaly: 207.2989 deg
Mean motion: 13.16827561 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 11958
Checksum: 327

Satellite: MET
Catalog number: 22782
Epoch time: 94040.74736914
Element set: 261
Inclination: 82.5509 deg
RA of node: 307.4298 deg
Eccentricity: 0.0021041

```
Arg of perigee: 221.4188 deg
Mean anomaly: 138.5364 deg
Mean motion: 13.83000237 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 2247
Checksum: 284

/EX
```

225. ORBS$042.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 13:54:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-042.m.1994@ampr.org>
Source record: 28129
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-042.M
Orbital Elements 042.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SAT
FROM WA5QGD FORT WORTH,TX February 11, 1994
BID: $ORBS-042.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94037.20759234
Element set: 252
Inclination: 98.6603 deg
RA of node: 114.2924 deg
Eccentricity: 0.0009404
Arg of perigee: 217.5862 deg
Mean anomaly: 142.4662 deg
Mean motion: 14.28001942 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 1900
Checksum: 273

Satellite: MIR
Catalog number: 16609
Epoch time: 94041.42205754
Element set: 131
Inclination: 51.6168 deg
RA of node: 102.3559 deg
Eccentricity: 0.0004327
Arg of perigee: 318.6406 deg
Mean anomaly: 41.4259 deg
Mean motion: 15.60125914 rev/day
Decay rate: 1.1161e-04 rev/day^2
Epoch rev: 45627
Checksum: 270

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94037.44922672
Element set: 434
Inclination: 28.4703 deg
RA of node: 355.6949 deg
Eccentricity: 0.0006487
Arg of perigee: 159.4554 deg
```

Mean anomaly: 200.6293 deg
Mean motion: 14.90460557 rev/day
Decay rate: 9.64e-06 rev/day^2
Epoch rev: 986
Checksum: 322

Satellite: GRO
Catalog number: 21225
Epoch time: 94040.40150147
Element set: 64
Inclination: 28.4620 deg
RA of node: 38.7432 deg
Eccentricity: 0.0003896
Arg of perigee: 207.9052 deg
Mean anomaly: 152.1343 deg
Mean motion: 15.40033195 rev/day
Decay rate: 5.773e-05 rev/day^2
Epoch rev: 3721
Checksum: 254

Satellite: UARS
Catalog number: 21701
Epoch time: 94041.38819457
Element set: 476
Inclination: 56.9858 deg
RA of node: 307.1671 deg
Eccentricity: 0.0004660
Arg of perigee: 110.5959 deg
Mean anomaly: 249.5594 deg
Mean motion: 14.96301395 rev/day
Decay rate: 2.182e-05 rev/day^2
Epoch rev: 13195
Checksum: 322

/EX

226. ORBS$042.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 13:57:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-042.n.1994@ampr.org>
Source record: 28130
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-042.N
2Line Orbital Elements 042.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SAT
FROM WA5QGD FORT WORTH,TX February 11, 1994
BID: $ORBS-042.N

DECODE 2-LINE ELSETS WIT
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94040.06708801 -.00000148 00000-0 10000-3 0 2607
2 14129 27.2057 342.5166 6022455 153.1354 258.3191 2.05877972 80144
UO-11
1 14781U 84021B 94040.53052044 .00000322 00000-0 62635-4 0 6637
2 14781 97.7907 61.1932 0011408 323.9974 36.0464 14.69140692531560
RS-10/11
1 18129U 87054A 94040.55124186 .00000030 00000-0 16659-4 0 8605
2 18129 82.9210 63.1886 0012804 25.2124 334.9655 13.72330924332409
AO-13
1 19216U 88051B 94040.93964943 .00000390 00000-0 10000-4 0 8755
2 19216 57.8821 268.9522 7208878 334.5703 3.1370 2.09717918 43343
FO-20
1 20480U 90013C 94035.98074861 -.00000022 00000-0 31548-4 0 6561
2 20480 99.0184 212.8744 0540153 279.0888 74.9498 12.83223693187179
AO-21
1 21087U 91006A 94041.01003248 .00000094 00000-0 82657-4 0 4237
2 21087 82.9396 236.8134 0036944 77.6411 282.8874 13.74533854152118
RS-12/13
1 21089U 91007A 94040.58590730 .00000042 00000-0 27829-4 0 6615
2 21089 82.9204 106.0890 0030651 102.2186 258.2406 13.74034795151126
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000 0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
UO-14
1 20437U 90005B 94037.22619383 .00000077 00000-0 47034-4 0 9612
2 20437 98.5971 123.7526 0010334 214.1893 145.8624 14.29821595210876
AO-16
1 20439U 90005D 94037.21681236 .00000071 00000-0 44536-4 0 7626
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2 20439 98.6031 124.8401 0010724 214.1741 145.8750 14.29877371210889
DO-17
1 20440U 90005E 94040.75231196 .00000060 00000-0 40428-4 0 7621
2 20440 98.6061 128.6181 0010852 203.0624 157.0068 14.30016024211408
WO-18
1 20441U 90005F 94037.22688753 .00000066 00000-0 42405-4 0 7628
2 20441 98.6048 125.1409 0011314 214.6745 145.3695 14.29991649210908
LO-19
1 20442U 90005G 94037.21376903 .00000072 00000-0 44757-4 0 7617
2 20442 98.6040 125.3540 0011701 213.9496 146.0939 14.30085714210913
UO-22
1 21575U 91050B 94040.70538846 .00000085 00000-0 43536-4 0 4637
2 21575 98.4469 117.7141 0007501 318.1128 41.9484 14.36888785134771
KO-23
1 22077U 92052B 94041.42783993 -.00000037 00000-0 10000-3 0 3583
2 22077 66.0820 185.3819 0009572 318.8321 41.1977 12.86284604 70485
AO-27
1 22825U 93061C 94037.24428981 .00000055 00000-0 40372-4 0 2598
2 22825 98.6630 114.3002 0008288 227.9109 132.1364 14.27605705 19007
IO-26
1 22826U 93061D 94037.72532850 .00000066 00000-0 44626-4 0 2603
2 22826 98.6651 114.7973 0008457 230.9496 129.0928 14.27708094 19076
KO-25
1 22830U 93061H 94040.70815228 .00000057 00000-0 40495-4 0 2625
2 22830 98.5680 116.3594 0011136 187.2116 172.8898 14.28032363 19500
NOAA-9
1 15427U 84123A 94040.90849396 .00000049 00000-0 50435-4 0 7095
2 15427 99.0697 89.8019 0014366 217.1066 142.9114 14.13586894472362
NOAA-10
1 16969U 86073A 94040.91622187 .00000075 00000-0 50459-4 0 6073
2 16969 98.5109 53.7900 0013419 346.1037 13.9772 14.24863433384485
MET-2/17
1 18820U 88005A 94040.41461213 .00000074 00000-0 52632-4 0 2603
2 18820 82.5397 10.2207 0016130 174.2344 185.9005 13.84706640304670
MET-3/2
1 19336U 88064A 94039.99790931 .00000051 00000-0 10000-3 0 2623
2 19336 82.5380 54.3969 0015730 222.0779 137.9138 13.16964807266383
NOAA-11
1 19531U 88089A 94040.89310848 .00000099 00000-0 78246-4 0 5131
2 19531 99.1603 26.7549 0012242 127.5055 232.7231 14.12957503277247
MET-2/18
1 19851U 89018A 94040.58249263 .00000046 00000-0 27583-4 0 2617
2 19851 82.5181 245.6465 0012880 224.0063 136.0047 13.84356993250031
MET-3/3
1 20305U 89086A 94040.90489425 .00000044 00000-0 10000-3 0 9823
2 20305 82.5493 357.9703 0005714 252.5364 107.5110 13.04423038206305
MET-2/19
1 20670U 90057A 94040.79306496 .00000024 00000-0 79036-5 0 7621
2 20670 82.5504 309.6649 0016176 139.0978 221.1403 13.84188455182995
FY-1/2
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1 20788U 90081A 94041.23792391 -.00000256 00000-0 -14146-3 0 8899
2 20788 98.8429 65.4112 0014899 8.2542 351.8867 14.01324157175928
MET-2/20
1 20826U 90086A 94040.59762982 .00000082 00000-0 60627-4 0 7618
2 20826 82.5218 247.4867 0014958 48.7238 311.5204 13.83572578170118
MET-3/4
1 21232U 91030A 94040.56395652 .00000051 00000-0 10000-3 0 6695
2 21232 82.5392 259.8160 0013347 141.0577 219.1526 13.16459526134562
NOAA-12
1 21263U 91032A 94039.95700562 .00000136 00000-0 80464-4 0 9196
2 21263 98.6320 70.4809 0012014 247.6730 112.3172 14.22366100142301
MET-3/5
1 21655U 91056A 94039.95480389 .00000051 00000-0 10000-3 0 6651
2 21655 82.5517 207.2863 0013312 152.8840 207.2989 13.16827561119586
MET-2/21
1 22782U 93055A 94040.74736914 .00000093 00000-0 71559-4 0 2616
2 22782 82.5509 307.4298 0021041 221.4188 138.5364 13.83000237 22471
POSAT
1 22829U 93061G 94037.20759234 .00000070 00000-0 45885-4 0 2520
2 22829 98.6603 114.2924 0009404 217.5862 142.4662 14.28001942 19004
MIR
1 16609U 86017A 94041.42205754 .00011161 00000-0 14078-3 0 1312
2 16609 51.6168 102.3559 0004327 318.6406 41.4259 15.60125914456273
HUBBLE
1 20580U 90037B 94037.44922672 .00000964 00000-0 81415-4 0 4349
2 20580 28.4703 355.6949 0006487 159.4554 200.6293 14.90460557 9866
GRO
1 21225U 91027B 94040.40150147 .00005773 00000-0 13376-3 0 648
2 21225 28.4620 38.7432 0003896 207.9052 152.1343 15.40033195 37217
UARS
1 21701U 91063B 94041.38819457 .00002182 00000-0 21249-3 0 4767
2 21701 56.9858 307.1671 0004660 110.5959 249.5594 14.96301395131953
/EX
```

227. Anybody hear the shuttle?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 17:17:49 UTC
From: brian@positron.amd.com
Message-ID: <CL2LDr.Hsz@dvorak.amd.com>
Source record: 28131

I've been listening to every early morning pass (3-6am local) and most afternoon passes since the shuttle went up. I've only heard them a few times, and most were very weak. The only strong pass was taken up entirely by one of the astronauts continuously calling some station that obviously never answered him. :-(

I'm using the same setup that I used to get a packet contact with STS-59, so I don't think that's the problem. I'm using the same orbital program that I used then (with updated STS-60 parameters) and my times coincide closely with what is posted for Houston, so I don't think I'm missing the time window.

What gives? I'd like to hear from those of you who've worked the shuttle this time around (or even heard them reliably). What equipment are you using? If you're within a few hundred miles of Austin, Texas, do you find the posted times are good? Are they turning the packet system off at night? It the shuttle oriented the wrong way for their indoor antenna?

Thanks for any answers you can supply...

Brian McMinn N5PSS brian.mcminn@amd.com

228. Mode-A questions

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 19:28:38 UTC
From: tavernin@sun1.interlan.com
Message-ID: <CL2rFs.Fpo@rd1.InterLan.COM>
Source record: 28132

I have a couple of Mode-A questions ...

1. What is the proper way of filling out the frequency info on a QSL card!?

2. Do these contacts count for the VUCC/Satellite award!?

Thanks,

Victor Tavernini / KE4JMY
Racal-Datacom, Inc.

tavernin@sun1.interlan.com

229. Two-Line Orbital Element Sets (TLE341)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 22:49:49 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.761006989@afit.af.mil>
Source record: 28133
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #341 -
Alouette 1
1 00424U 62049 94041.06937474 .00000056 00000-0 55125-4 0 9655
2 00424 80.4612 50.4223 0024595 81.5881 278.8045 13.67797181565027
ATS 3
1 03029U 67111A 94038.19454828 -.00000126 00000-0 10000-3 0 1621
2 03029 14.5628 8.8327 0011492 265.6793 187.2659 1.00272950 96138
Cosmos 398
1 04966U 71016A 94042.17843103 .00134395 65290-5 30964-3 0 62
2 04966 51.4579 94.7651 1158051 358.0140 1.6374 13.57093597755425
Starlette
1 07646U 75010A 94040.61147996 -.00000141 00000-0 54887-7 0 7585
2 07646 49.8289 296.7859 0206204 274.7639 82.9739 13.82185155960207
LAGEOS
1 08820U 76039A 94041.57970012 .00000023 00000-0 10000-3 0 9654
2 08820 109.8444 92.2437 0044389 312.3965 47.3106 6.38664327159061
ETS-2
1 09852U 77014A 94023.64131451 -.00000349 00000-0 10000-3 0 9470
2 09852 11.8975 43.2631 0000491 342.8997 99.7274 1.00016839 9210
GOES 2
1 10061U 77048A 94041.60997580 .00000064 00000-0 10000-3 0 2858
2 10061 10.9655 47.2684 0001216 342.0054 195.2474 1.00260154 5843
IUE
1 10637U 78012A 94040.74440995 -.00000284 00000-0 10000-3 0 9713
2 10637 34.4064 96.9552 1305197 32.0819 224.3041 1.00245059 11447
GPS BI-01
1 10684U 78020A 94036.46343223 .00000004 00000-0 10000-3 0 2503
2 10684 64.5592 49.4293 0063599 163.7934 196.4886 1.98069621102320
GPS BI-02
1 10893U 78047A 94031.36756412 -.00000010 00000-0 10000-3 0 434
```

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2 10893 63.5978 288.8006 0212017 13.8231 346.8319 2.01627528115312
GOES 3
1 10953U 78062A 94041.25393984 .00000054 00000-0 10000-3 0 2730
2 10953 9.8800 49.7776 0004467 119.9291 246.3583 1.00275494 10451
SeaSat 1
1 10967U 78064A 94041.99387108 .00000101 00000-0 77963-4 0 2655
2 10967 108.0001 201.0450 0001877 240.6413 119.4535 14.37921896818229
GPS BI-03
1 11054U 78093A 94041.63598018 -.00000004 00000-0 10000-3 0 1593
2 11054 63.2990 285.4847 0043212 176.1309 183.9671 1.93505120112060
Nimbus 7
1 11080U 78098A 94040.68937454 -.00000025 00000-0 15618-4 0 3655
2 11080 99.0725 288.9554 0009495 111.8791 248.3370 13.83729700772441
GPS BI-04
1 11141U 78112A 94040.31185017 -.00000004 00000-0 00000+0 0 8623
2 11141 64.5663 50.3425 0047704 26.0007 334.2798 1.92894722 1311
GPS BI-05
1 11690U 80011A 94035.28100515 .00000001 00000-0 10000-3 0 7577
2 11690 64.8639 51.2905 0143914 185.0641 174.9048 2.00553216116874
GPS BI-06
1 11783U 80032A 94029.88381990 .00000009 00000-0 10000-3 0 9536
2 11783 62.7118 282.8573 0208782 29.4629 331.7882 2.03456606101142
GOES 5
1 12472U 81049A 94032.49890686 .00000100 00000-0 10000-3 0 7472
2 12472 6.5371 59.6666 0004150 355.6865 113.8766 1.00267335 4403
Cosmos 1383
1 13301U 82066A 94040.04047812 .00000042 00000-0 31870-4 0 2636
2 13301 82.9271 43.7127 0029095 86.7516 273.6957 13.68050910579903
LandSat 4
1 13367U 82072A 94041.77979221 .00000162 00000-0 46002-4 0 4430
2 13367 98.1991 102.4947 0006391 292.9590 67.0932 14.57118918615656
IRAS
1 13777U 83004A 94039.55714304 -.00000026 00000-0 11956-4 0 5681
2 13777 98.9711 233.1547 0012973 315.1344 44.8768 13.99199013233156
Cosmos 1447
1 13916U 83021A 94041.15035423 .00000015 00000-0 -62299-7 0 3643
2 13916 82.9454 105.6674 0039165 25.0445 335.2605 13.74304680545887
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2 14050 5.3553 62.5030 0007883 125.0964 261.5218 1.00224827 11511
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1 14780U 84021A 94041.74933764 .00000128 00000-0 38361-4 0 296
2 14780 98.1803 103.9288 0003902 305.0579 55.0240 14.57125758529068
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2 15331 82.5330 195.9397 0018604 261.8864 98.0241 14.84282271505781
NOAA 9
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2 15427 99.0695 90.9496 0014405 213.7271 146.2987 14.13587457472525
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SPOT 1
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Kvant-1
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2 17845 51.6177 100.1014 0004010 320.2692 39.7488 15.60138977456416
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1 18123U 87053A 94041.96455474 .00000048 00000-0 46851-4 0 3028
2 18123 98.7887 235.5076 0013976 176.7646 183.3620 14.15334661343158
RS-10/11
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Meteor 2-17
1 18820U 88005A 94042.00429503 .00000063 00000-0 42302-4 0 2618
2 18820 82.5398 8.9560 0016239 169.7058 190.4436 13.84706697304893
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1 18822U 88006A 94040.85927695 .00000100 00000-0 62998-4 0 4030
2 18822 98.4581 260.9803 0006903 5.7012 354.4242 14.22926371312411
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2 19163 64.9981 114.8206 0006902 160.9311 199.1267 2.13101994 43887
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METEOSAT 3
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2 19215 1.4385 73.0724 0002506 263.6960 145.4256 1.00272177 8607
AO-13
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2 19216 57.8821 268.9522 7208878 334.5703 3.1370 2.09717918 11843
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Meteor 3-2
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2 19336 82.5380 54.3969 0015730 222.0779 137.9138 13.16964807266383
Glonass 39
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2 19503 65.7435 353.6601 0004673 173.3108 186.6842 2.13102296 42026
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2 19531 99.1605 27.8414 0012274 124.5667 235.6663 14.12957646277398
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2 19749 64.9474 114.3471 0005833 267.0998 92.9060 2.13100955 39539
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2 19750 64.9549 114.4303 0006501 247.7012 112.2685 2.13101622 39524
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2 19802 55.0825 144.7728 0034613 176.5317 183.5016 2.00573788 36493
Akebono
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Nadezhda 1
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2 20217 0.0546 294.3775 0000152 215.1710 277.1827 1.00276938 16817
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Meteor 3-3
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2 20724 54.7184 143.1451 0109074 158.3284 202.1343 2.00562164 25779
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Glonass 58
1 22058U 92047C 94040.03776396 -.00000086 00000-0 00000+0 0 8248
2 22058 64.9386 353.3566 0011428 281.6048 78.2558 2.13102819 11904
TOPEX
1 22076U 92052A 94041.86874017 -.00000038 00000-0 10000-3 0 7257
2 22076 66.0364 193.3702 0007461 266.0398 93.9764 12.80930806 70317
KITSAT-A
1 22077U 92052B 94041.81659553 -.00000037 00000-0 10000-3 0 3591
2 22077 66.0819 184.5678 0009699 319.1167 40.9125 12.86284616 70530
S80/T
1 22078U 92052C 94041.38582741 -.00000037 00000-0 10000-3 0 3587
2 22078 66.0814 184.8880 0011073 321.9633 38.0605 12.86566249 70549
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TOPEX R/B
1 22079U 92052D 94040.50414078 -.00000038 00000-0 10000-3 0 3590
2 22079 66.0633 204.3142 0075914 257.3610 101.8903 12.77659499 70033
GPS BIIA-15
1 22108U 92058A 94041.33696208 .00000008 00000-0 10000-3 0 3662
2 22108 54.4149 262.6565 0105815 134.2972 226.6378 2.00570703 10382
FREJA
1 22161U 92064A 94039.07565927 -.00000018 00000-0 40721-4 0 3621
2 22161 63.0061 259.2988 0777790 303.7662 49.1577 13.21723767 64739
LAGEOS II
1 22195U 92070B 94039.77951928 -.00000009 00000-0 10000-3 0 2627
2 22195 52.6406 174.8404 0138545 61.4203 300.0223 6.47294172 30638
GPS BIIA-16
1 22231U 92079A 94038.53412347 .00000028 00000-0 10000-3 0 3707
2 22231 54.7428 204.1690 0036651 294.9075 64.7159 2.00562549 8903
GPS BIIA-17
1 22275U 92089A 94035.68551764 .00000067 00000-0 10000-3 0 3743
2 22275 54.6758 201.8025 0050907 247.3397 112.0915 2.00556769 8253
TDRS 5
1 22314U 93003B 94039.04639483 -.00000297 00000-0 10000-3 0 3671
2 22314 0.8181 73.2597 0002592 274.1490 121.1551 1.00279212 4037
GPS BIIA-18
1 22446U 93007A 94037.26085256 -.00000094 00000-0 10000-3 0 3626
2 22446 54.7383 322.6385 0071768 340.7578 18.9937 2.00547121 7312
Glonass 59
1 22512U 93010A 94040.01895727 -.00000002 00000-0 00000+0 0 5090
2 22512 64.8928 113.2645 0009459 201.6347 158.3838 2.13102033 7382
Glonass 60
1 22513U 93010B 94041.83653094 .00000012 00000-0 00000+0 0 5271
2 22513 64.8823 113.2148 0007290 202.6149 157.4207 2.13102381 7619
Glonass 61
1 22514U 93010C 94042.07209888 .00000013 00000-0 00000+0 0 5076
2 22514 64.8928 113.1911 0013865 194.9589 165.0681 2.13101614 7629
ASTRO-D
1 22521U 93011A 94040.40511439 .00001913 00000-0 16230-3 0 2644
2 22521 31.1051 158.4087 0076874 284.3024 74.9111 14.92967198 52986
UFO F1
1 22563U 93015A 94032.01305808 .00000068 00000-0 10000-3 0 2574
2 22563 26.8887 301.7660 0007242 309.2279 292.6065 0.99248610 7487
GPS BIIA-19
1 22581U 93017A 94033.90713181 -.00000049 00000-0 10000-3 0 2730
2 22581 55.0569 23.0074 0044069 31.6174 328.6643 2.00571831 6264
ProgressM17
1 22588U 93019A 94042.21893176 .00327037 11550-4 28214-3 0 5043
2 22588 51.6150 75.1054 0047636 253.0118 106.5670 16.10065504 49694
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000+0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
GPS BIIA-20
1 22657U 93032A 94036.03248523 -.00000054 00000-0 10000-3 0 2692
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2 22657 55.0720 22.7689 0053917 201.8325 158.1517 2.00563374 1631
GPS BIIA-21
1 22700U 93042A 94037.49592241 .00000028 00000-0 10000-3 0 2681
2 22700 54.6074 263.5216 0025878 317.4555 42.4137 2.00573245 4467
NOAA 13
1 22739U 93050A 94041.84333682 .00000013 00000-0 31763-4 0 3234
2 22739 98.9336 346.8163 0010651 113.2887 246.9406 14.10878898 26145
GPS BIIA-22
1 22779U 93054A 94036.09073962 -.00000091 00000-0 10000-3 0 2860
2 22779 54.8582 322.6225 0024309 231.6105 128.1914 2.00562208 3193
Meteor 2-21
1 22782U 93055A 94040.74736914 .00000093 00000-0 71559-4 0 2616
2 22782 82.5509 307.4298 0021041 221.4188 138.5364 13.83000237 22471
UFO F2
1 22787U 93056A 94033.69549884 -.00000049 00000-0 10000-3 0 2587
2 22787 4.9536 323.1103 0084265 115.0649 15.1023 1.00250453 449
SPOT 3
1 22823U 93061A 94040.75868082 .00000169 00000-0 10000-3 0 2709
2 22823 98.7292 117.1029 0001035 50.2631 309.8619 14.20034438 19402
STELLA
1 22824U 93061B 94040.72636451 -.00000074 00000-0 -12479-4 0 2609
2 22824 98.6655 117.7033 0005620 215.1649 144.9156 14.27094537 19497
KO-25
1 22825U 93061C 94041.72987307 .00000043 00000-0 35458-4 0 2606
2 22825 98.6620 118.7475 0008028 215.7478 144.3157 14.27606252 19647
POSAT-1
1 22826U 93061D 94042.21058899 .00000053 00000-0 39268-4 0 2612
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
HEATHSAT
1 22827U 93061E 94042.20074436 .00000066 00000-0 44578-4 0 3230
2 22827 98.6630 119.2172 0008654 203.2830 156.7954 14.27813763 19716
ITAMSAT
1 22828U 93061F 94033.16080271 .00000130 00000-0 70450-4 0 2587
2 22828 98.6671 110.2614 0008841 239.0441 120.9890 14.27812252 18428
EYESAT-1
1 22829U 93061G 94041.69193038 .00000076 00000-0 48514-4 0 2531
2 22829 98.6611 118.7408 0009591 203.2384 156.8360 14.28002966 19648
1993 061H
1 22830U 93061H 94041.68908292 .00000047 00000-0 36246-4 0 2636
2 22830 98.5679 117.3215 0011194 184.3035 175.8051 14.28032452 19649
GPS BIIA-23
1 22877U 93068A 94041.12971090 -.00000008 00000-0 10000-3 0 780
2 22877 55.1198 83.5520 0031299 289.5205 70.2082 2.00553828 2188
Meteosat 6
1 22912U 93073B 94037.86940448 -.00000103 00000-0 00000+0 0 685
2 22912 1.1846 268.3790 0002112 2.1827 168.9448 1.00270700 859
HST Array
1 22920U 90037C 94041.17352807 .00011546 00000-0 10236-2 0 762
2 22920 28.4722 329.4031 0004087 352.4154 7.6382 14.94751146 10455
Soyuz TM-18
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1 22957U 94001A 94041.87043032 .00018949 00000-0 23432-3 0 421
2 22957 51.6177 100.1014 0004010 320.2692 39.7488 15.60138977 5269
GALS 1
1 22963U 94002A 94040.40368174 .00000118 00000-0 00000+0 0 199
2 22963 0.2153 299.7669 0000694 95.5619 293.4096 1.00283420 190
1994002D
1 22966U 94002D 94041.03822384 .00000118 00000-0 00000+0 0 55
2 22966 0.2079 297.9944 0001348 84.9983 174.8771 1.00290764 202
Meteor 3-6
1 22969U 94003A 94040.27653168 .00000118 00000-0 27570-3 0 185
2 22969 82.5645 146.5027 0014684 222.4682 137.5294 13.16719325 2016
TUBSAT
1 22970U 94003B 94039.51546704 -.00000167 00000-0 -46616-3 0 198
2 22970 82.5663 147.0395 0015740 219.8894 140.1072 13.16824928 1919
1994003C
1 22971U 94003C 94039.81930643 -.00000083 00000-0 -24935-3 0 200
2 22971 82.5639 146.8244 0014648 221.2793 138.7096 13.16839129 1956
1994003D
1 22972U 94003D 94025.38316413 .00186325 00000-0 47579+0 0 28
2 22972 82.5660 157.0055 0014254 255.9324 104.1467 13.16807686 54
DSPSE
1 22973U 94004A 94034.53938549 .00306989 69601-5 12994+0 0 230
2 22973 66.8036 61.5120 9071498 202.2030 45.6648 0.46368841 1370
1994004B
1 22974U 94004B 94041.02913373 .01449537 59898-5 69148-3 0 378
2 22974 67.0319 38.4607 0021744 151.1592 210.7101 16.20452841 2469
ProgressM21
1 22975U 94005A 94041.87043032 .00018949 00000-0 23432-3 0 290
2 22975 51.6177 100.1014 0004010 320.2692 39.7488 15.60138977 2165
1994005B
1 22976U 94005B 94028.08392211 -.00003826 12096-4 00000+0 0 29
2 22976 51.3409 170.1185 0019041 92.4280 267.4761 16.28728285 05
STS 60
1 22977U 94006A 94041.25000000 .00000417 00000-0 75807-5 0 154
2 22977 56.9879 185.8034 0006879 304.3677 92.0407 15.71677067 1068
1994007A
1 22978U 94007A 94034.91970139 .00000150 00000-0 00000+0 0 16
2 22978 30.5073 159.4204 0007002 226.1375 134.0418 15.37491022 03
1994007B
1 22979U 94007B 94041.48930328 -.00000127 00000-0 37735-3 0 62
2 22979 28.5686 158.2944 7221686 164.9218 241.1063 2.24302288 156
1994008A
1 22981U 94008A 94041.43409752 .00000021 00000-0 10000-3 0 94
2 22981 1.4816 272.7561 0025525 15.8332 58.6882 0.98749057 67
1994008B
1 22982U 94008B 94038.55679731 .24388682 12670-4 42219-3 0 174
2 22982 51.6901 263.8820 0013228 291.3514 67.1521 16.46734436 362
1994008C
1 22983U 94008C 94037.03045885 .65903693 12772-4 78377-3 0 70
2 22983 51.5941 272.4488 0008824 15.1517 345.3325 16.49327242 115
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1994008D
1 22984U 94008D 94041.22207020 -.00000005 00000-0 10000-3 0 13
2 22984 1.4999 274.7996 0085891 290.8345 68.6276 0.98425571 56
1994008E
1 22985U 94008E 94040.90951087 .00000050 00000-0 10000-4 0 73
2 22985 47.4029 274.7014 7306983 1.1550 0.0384 2.22674698 110
1994008F
1 22986U 94008F 94037.76812678 .00000000 00000-0 10000-3 0 36
2 22986 47.4985 275.5300 7287190 0.3776 0.3901 2.22316111 29
1994004C
1 22987U 94004C 94030.19848196 -.00000610 00000-0 00000+0 0 18
2 22987 66.8677 61.5912 9062991 202.4263 45.7189 0.46073591 08
1994006H
1 22998U 94006H 94041.68853462 .00495538 00000-0 33513-2 0 36
2 22998 56.9815 183.8639 0031663 355.1629 4.6409 15.72544158 09
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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230. STS-62 Element Set (94062.636)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-11 23:35:04 UTC
From: elements-request@alsys.com
Message-ID: <STS-62.94062.636@alsys.com>
Source record: 28134
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-62
1 00062U 94062.63664409 .00073440 00000-0 22129-3 0 29
2 00062 39.0115 247.8629 0006644 298.2691 61.7477 15.90695888 27

Satellite: STS-62
Catalog number: 00062
Epoch time: 94062.63664409 = (03 MAR 94 15:16:46.05 UTC)
Element set: 002
Inclination: 39.0115 deg
RA of node: 247.8629 deg Space Shuttle Flight STS-62
Eccentricity: .0006644 Prelaunch Element set JSC-002
Arg of perigee: 298.2691 deg Launch: 03 MAR 94 13:54 UTC
Mean anomaly: 61.7477 deg
Mean motion: 15.90695888 rev/day G. L. Carman
Decay rate: 7.3440e-04 rev/day*2 NASA Johnson Space Center
Epoch rev: 2

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris KK6YB Internet: elements-request@alsys.com
San Diego, CA, USA Phone: +1 619-457-2700
```

231. WARNING: message delayed at "chx400.switch.ch"

Newsgroup: rec.radio.amateur.space
Date: 1994-02-12 21:52:30 UTC
From: postmaster@switch.CH
Message-ID: <199402122153.NAA03005@ucsd.edu>
Source record: 28135

********** THIS MESSAGE IS AUTOMAGICALLY GENERATED BY THE GATEWAY **********

Dear user ham-space@UCSD.EDU,

your message msg.17623-0 to

hb9boj@hb9eh.ampr.org

with ua-id: Ham-Space Dig...
and p1-id: <199402101213.EAA01487@ucsd.edu>

waits on chx400.switch.ch for submission to its final destination.

Delivery problems are caused in most cases by incorrect addresses or
hosts being down, seldom by network problems. Delivery attempts will now
continue for another 138 hours. In case of failure, a non-delivery
report will be returned to you after that time.

postmaster@chx400.switch.ch

232. AO-13 Skeds with ID & WY?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-13 14:24:43 UTC
From: mah5@po.CWRU.Edu
Message-ID: <2jld7c$nui@usenet.INS.CWRU.Edu>
Source record: 28136

Can anyone help me with working Idaho or Wyoming on satellite?
If you are interested contact me by e-mail and maybe we can set
up a schedule. Any help would be greatly appreciated.

I will respond to all e-mails.

Thanks,

Mark, N8VEA
mah5@po.cwru.edu

233. ANS-043 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-13 20:49:06 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-043.01.1994@ampr.org>
Source record: 28137
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT
N0CCZ BECOMES A SILENT KEY

HR AMSAT NEWS SERVICE BULLETIN 043.01 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.01

Andy Freeborn (N0CCZ) Becomes A Silent Key

It is with great sadness that AMSAT-NA HQ reports that an old friend of TAPR and AMSAT has become a silent key -- Andy Freeborn (N0CCZ) of Colorado Springs. Andy succumed this past week due to cancer at age 72.

Andy was an Air Force pilot who retired to Colorado Springs where he became an amateur and then later involved in packet radio activities. For a number of years he was a member of TAPR's Board of Directors and he served for a couple of years as the TAPR President. In that role he did yeoman duty for AMSAT coordinating TAPR's involvement in the MICROSAT development and he helped kick off the joint TAPR/AMSAT DSP development activities. Andy will certainly be missed!

[The AMSAT News Service would like to thank Tom Clark (W3IWI) for this bulletin item.]

/EX
SB SAT
PHASE-3D FUEL TANKS ARRIVE

HR AMSAT NEWS SERVICE BULLETIN 043.02 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.02

Phase-3D Rocket Fuel Tanks Arrive

On February 8, 1994 AMSAT-DL was informed of the arrival of the six tanks for the AMSAT P3-D spacecraft. Each tank is capable of storing about 50 lbs of rocket propellant. The tanks were manufactured in Russia according to AMSAT specifications. AMSAT-DL was able to order and purchase these tanks under very favorable conditions with the help of AMSAT-UA. "The arrival of these tanks constitutes a major milestone in the fabrication of AMSAT's P3-D satellite. It is another shining example of the international cooperation within the P3-D project and amateur radio in general," said Dr. Karl Meinzer (DJ4ZC), AMSAT-DL President and Project Head.

[The AMSAT News Service (ANS) would like to thank Peter Guezlow (DB2OS), AMSAT P3-D Project Team Member, for this bulletin.]

/EX
SB SAT
AMSAT TURNS 25 YEARS OLD SOON

HR AMSAT NEWS SERVICE BULLETIN 043.03 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.03

AMSAT Turns 25 Years Old Soon; WA0PTV Is Preparing AMSAT Journal Issue

This spring AMSAT will turn the quarter century mark. The AMSAT Journal Editor, John Hansen (WA0PTV) is already starting to prepare an AMSAT Journal for this historic occasion. He would very much like to hear from the users of OSCAR satellites about what they feel should be included in this historic issue. He is particularly interested to hear from those who wish to contribute information, photos, or articles to this issue of the AMSAT Journal. This 25th "birthday" issue will be published as the March/April issue of The AMSAT Journal. If you feel that you would like to contribute to this "birthday" issue, please contact WA0PTV at either his INTERNET mail address of wa0ptv@amsat.org or to his home address, 49 Maple Avenue, Fredonia, NY, 14063.

/EX
SB SAT
AO-13 OPERATIONS NET

HR AMSAT NEWS SERVICE BULLETIN 043.04 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.04

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

20-Feb-94 0200 B 070 WA5ZIB W5IU
28-Feb-94 0430 B 068 WB6LLO W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

/EX
SB SAT
IO-26 BBS RET

HR AMSAT NEWS SERVICE BULLETIN 043.05 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.05

ITAMSAT-OSCAR-26 (IO-26) Returns To Service

After the software crash occurred on the 07-DEC-93, the ITAMSAT (IO-26) Command Team decided to delay the reloading of the code inorder to improve the onboard software and further analyze the Whole Orbit Data (W0D) dumps, to better understand the satellite motion and operation. On the 06-JAN-94, the final version of the code was validated by the Command Team and the BBS was re-opened to all the users. The integrated housekeeping software (IHT ver 2.1) now has WOD capabilities and weekly data dumps will be taken without affecting the BBS operations. It should be remembered by all users that the BBS call sign is ITMSAT-11 for receiving broadcasts and ITMSAT-12 for uploads. Also, the standard PB and PG ground software is needed for accessing the BBS. The downlink frequency is 435.867 MHz using PSK at 1200 baud. Albert Zagni (I2KBD), ITAMSAT Command Team member wishes everyone to "Enjoy ITAMSAT!"

/EX
SB SAT
STRAIGHT KEY NIGHT RESULTS

HR AMSAT NEWS SERVICE BULLETIN 043.06 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.06

OSCAR Straight Key Night Shows Off The "BEST FISTS"

Many thanks to all who participated in the 22nd Annual Straight Key Night on the OSCARs, 1-JAN-94. The following "Best Fist" nominations have been received: W1NU, WQ3Y and W6HDO. Although AMSAT didn't ask that logs be submitted, several participants also reported working AMSAT-NA's esteemed President, W3XO/5, in one of Bill Tynan's rare appearances on CW (PVRC members especially will appreciate the significance of this occasion). An "honorary" Best Fist nomination goes to you, Bill; let's hope that more SSB operators will follow your fine example, dust off their old pump handles, and enjoy the fun. See you all next year!

73, Ray W2RS

/EX
SB SAT
STS-60 POST FLIGHT SYNOPIS

HR AMSAT NEWS SERVICE BULLETIN 043.07 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 12, 1994

TO ALL RADIO AMATEURS BT
BID: $ANS-043.07

STS-60 SAREX Post Flight Synopsis

The first Shuttle Amateur Radio Experiment (SAREX) flight of 1994 can be considered a resounding success. The STS-60 Space Shuttle Discovery mission, which included Astronauts Charlie Bolden, KE4IQB, Ron Sega, KC5ETH, and Russian Cosmonaut Sergei Krikalev, U5MIR concluded on Friday February 11 with a picture perfect touchdown at the Kennedy Space Center. During the mission, nearly 4000 packet connections were made with the SAREX station on Discovery by ham radio operators on the ground. Several voice contacts were also made, primarily late in the mission. True U.S.-Russian cooperation was demonstrated on this flight through on-board experimentation and operation of the SAREX station.

SAREX was officially activated at 14:27 UTC on February 4 with a successful voice contact through the University of Surrey amateur radio station. Doug Loughmiller, G0SYX was the control operator to initiate this first contact with the STS-60 crew.

A highly successful direct contact was completed one orbit later with a school group in Boise Idaho. The contact, held at the Discovery Center included students from several schools including the Boise Senior High School. 19 students were able to ask direct questions to Shuttle Commander Charlie Bolden.

One of the SAREX mission highlights occurred at 10:42 UTC on February 6. Sergei Krikalev, U5MIR, initiated a contact with a school group at the House of Science and Technology for Youth in Moscow, Russia. This represents the first time a cosmonaut on a U.S. space shuttle has communicated with a group in Russia. Leo Lebutin, UA3CR and Valery Agabekov, UA6HZ were the prime school group coordinators for this contact. During the contact Musa Manarov, U2MIR, gave Sergei greetings from Russia. Six students were able to ask their questions to the crew on the Space Shuttle Discovery. In addition, several cosmonauts were on hand to hear the communications. The SAREX contact was also broadcast live throughout Russia on HF (80 meters, 40 meters and 20 meters) as well as on VHF.

Problems with the Wake Shield Facility primary payload affected the SAREX payload somewhat. The Mars, Pennsylvania school contact, had to be rescheduled 4 times before a successful contact was made. 8 students were able to ask questions to Sergei Krikalev and Jan Davis during this contact. The students and teachers should be commended for their persistence and patience.

Other scheduled contacts included the Chariton High School, in Chariton, Iowa, where 3 questions were answered and the James Bean School in Sidney, Maine, where 11 students asked questions to the crew on Discovery.

The following packet message was received by AMSAT member Doug Howard, KG5OA, during one of the last SAREX passes:

[2/10/94 12:11:21]W5RRR-1>QST:
Greetings from Discovery on our sixth day in orbit. We enjoyed a conversation with President Clinton while he was visiting Houston Mission Control yesterday This morning we talked with our colleagues on Mir via satellite and we hope to talk with the Mir cosmonauts today with SAREX. Thanks for your interest and support of our flight. Best wishes from the crew of STS-60.

FYI, unfortunately the Shuttle crew was unsuccessful in their attempts to communicate with the MIR crew using SAREX.

Those of you who have heard or worked the STS-60 crew and wish to receive a QSL card need to send your signal report and an SASE or an envelope and IRCs to the following address:

STS-60 QSL
Education Activities Division
ARRL
225 Main St
Newington, CT 06111

School groups interested in communicating with the Shuttle astronauts are reminded to submit an application and proposal to the ARRL to be considered for a future contact. Final SAREX school group selections are decided approximately 6 months prior to the mission launch date. For more information, please write:

Educational Activities Division
ARRL
225 Main St
Newington, CT 06111

School groups are always welcome to listen into a school group contact when a telebridge contact occurs. We had several schools listening to the Mars, PA contact. For more details on how to listen in through the telebridge, please contact the ARRL at the above address or Frank Bauer, KA3HDO of AMSAT. His e-mail address is ka3hdo@amsat.org

The next SAREX flight, STS-59 is scheduled for April 7. It will be a high inclination (57 degree) mission with voice and packet on-board.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX
SB SAT
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 043.08 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-043.08

Weekly OSCAR Status Reports: 12-FEB-94

AO-13: Current Transponder Operating Schedule:
L QST
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
Poor Sun angle and battery testing need maximum OFF time.
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current FO-20 operating schedule:
From January '94 thru March '94, the analog mode and the
digital mode will be on alternately for a week at a time.
ANALOG MODE:
23-FEB-94 8:05 -TO- 02-MAR-94 6:40 UTC
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Up and running. All appears to be back to normal. [WH6I]

KO-25: BBS is running. It appears that 145.980 MHz is the proper uplink
frequency and the downlink frequency is 436.500 MHz. There are a
number of images on the bird, some in a yet to be described format.
[WH6I]

POSAT: PoSAT is up and running. The processor seems very fast compared
to the other 9600 baud birds and faster through puts are common. A
note on the bird seems to imply that the "amateur experiment" will
be ending soon but no are details available. PoSAT has two uplink
frequencies: 145.925 & 145.975 MHz. The corresponding downlink
frequencies: 435.250 & 435.275 MHz. [WH6I]

IO-26: Is back up and running (1200 baud) and seeing a lot of use. [WH6I]

DOVE: Just a small correction on the address on where to send your DOVE
QSL and shortwave listener reports. PY2BJO reports that if you use
the "extended" zip code for his address, your QSL cards and reports
will arrive sooner. For completeness, his address is as follows:
Dr. Junior Torres De Castro (PY2BJO), 119 Rua Macaubal, Sao Paulo,
Brazil 01256-150. [PY2BJO]

RS-10: With the sudden rise of Solar Flux and 28 MHz open between W and G,
both RS-10 and RS-12 have been giving excellent downlink signals
when well below the user's horizon. GM4IHJ reports hearing the

satellites when over most continents, and DJ8DT reports hearing RS-10's 29.357 MHz beacon when the satellite was overflying Antarctica. Also, ZS6AOP is very active from grid location KG33WV and has made some spectacular contacts on RS-10. He invites all radio amateurs in the surrounding countries to listen for him on RS-10's 10M downlink. [G3IOR & ZS6AOP]

MIR: G3BGM heard MIR working IK1SLD on 144.450 MHz today 03-FEB-94 at 06:21 UTC. The theory about the use of this frequency by the MIR cosmonauts was to avoid clashing with the STS-60 operations. [G3IOR]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

234. WARNING: message delayed at "chx400.switch.ch"

Newsgroup: rec.radio.amateur.space
Date: 1994-02-13 21:52:38 UTC
From: postmaster@switch.CH
Message-ID: <199402132153.NAA19995@ucsd.edu>
Source record: 28138

********** THIS MESSAGE IS AUTOMAGICALLY GENERATED BY THE GATEWAY **********

Dear user ham-space@UCSD.EDU,

your message msg.17623-0 to

hb9boj@hb9eh.ampr.org

with ua-id: Ham-Space Dig...
and p1-id: <199402101213.EAA01487@ucsd.edu>

waits on chx400.switch.ch for submission to its final destination.

Delivery problems are caused in most cases by incorrect addresses or
hosts being down, seldom by network problems. Delivery attempts will now
continue for another 114 hours. In case of failure, a non-delivery
report will be returned to you after that time.

postmaster@chx400.switch.ch

235. Daily IPS Report - 12 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 02:25:23 UTC
From: dave@eram.esi.com.au
Message-ID: <5182@eram.esi.com.au>
Source record: 28139
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 11 February 1994
Summary for 11 February and Forecast up to 14 February
IPS Warning 04 was issued on 11 Feb and is still current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 093/038

1B. SOLAR FORECAST
12 February 13 February 14 February
Activity Low Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 090/034

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled 00-09 and 21-24UT, and at
storm levels at other times.

Estimated Indices : A K Observed A Index 10 February
Learmonth 35 3336 5553
Fredericksburg 32 28
Planetary 42 31

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
12 Feb 30 Unsettled to active levels, with occasional minor
storm periods.
13 Feb 25 Active.
14 Feb 25 Active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

11 Feb fair-normal poor-fair poor
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
12 Feb fair-normal poor-fair poor
13 Feb fair-normal poor-fair poor
14 Feb fair-normal poor-fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values, with Sporadic E
blanketing at 08UT.

T index: 20

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
12 Feb 20 10 to 15% below predicted monthly values.
13 Feb 20 10 to 15% below predicted monthly values.
14 Feb 10 10 to 20% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Intermittent Sporadic E layer, and continued geomagnetic activity,
may have combined to degrade local propagation conditions yesterday.
Similar conditions are expected for today. Conditions at Townsville
appeared fair to normal yesterday.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

236. Daily IPS Report - 13 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 02:26:08 UTC
From: dave@eram.esi.com.au
Message-ID: <5183@eram.esi.com.au>
Source record: 28140
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 12 February 1994
Summary for 12 February and Forecast up to 15 February
IPS Warning 04 was issued on 11 Feb and is still current.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 098/045

1B. SOLAR FORECAST
13 February 14 February 15 February
Activity Low Low to moderate Low to moderate
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 103/052

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled to active, apart from
minor storm levels 12-15UT.

Estimated Indices : A K Observed A Index 11 February
Learmonth 20 3334 5443
Fredericksburg 29 38
Planetary 35 41

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
13 Feb 30 Unsettled to active levels, with occasional minor
storm periods.
14 Feb 30 Active.
15 Feb 40 Active to minor storm.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

12 Feb fair-normal poor-fair poor
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
13 Feb fair-normal poor-fair poor
14 Feb fair-normal poor-fair poor
15 Feb fair-normal poor-fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Continuing geomagnetic activity is degrading global HF propagation
conditions.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values.

T index: 26

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
13 Feb 30 Near predicted monthly values.
14 Feb 10 10 to 15% below predicted monthly values.
15 Feb 0 About 20% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Regular Sporadic E layer, and continued geomagnetic activity, may
have combined to degrade local propagation conditions yesterday.
Similar conditions are expected for today. Conditions at Townsville
appeared fair to normal yesterday.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

237. Daily IPS Report - 14 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 02:26:41 UTC
From: dave@eram.esi.com.au
Message-ID: <5184@eram.esi.com.au>
Source record: 28141
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 13 February 1994
Summary for 13 February and Forecast up to 16 February
IPS Warning 04 was issued on 11 Feb and is still current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 098/045

1B. SOLAR FORECAST
14 February 15 February 16 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 100/048

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled to active, apart from
minor storm levels 18-21UT.

Estimated Indices : A K Observed A Index 12 February
Learmonth 23 3334 3454
Fredericksburg 27 27
Planetary 30 36

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
14 Feb 30 Unsettled to active levels, with occasional minor
storm periods.
15 Feb 30 Unsettled to active levels, with occasional minor
storm periods.
16 Feb 20 Unsettled to active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND

DATE LOW MIDDLE HIGH
13 Feb normal fair poor
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
14 Feb fair-normal poor-fair poor
15 Feb fair-normal poor-fair poor
16 Feb normal fair poor-fair
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values until 16UT, apart from enhancements of 15-40% from 11-15UT, and 15-30% depressed from 17UT onwards.

T index: 36

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
14 Feb 30 Near predicted monthly values.
15 Feb 10 10 to 20% below predicted monthly values.
16 Feb 10 10 to 20% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Intermittent Sporadic E layer, and continued geomagnetic activity, may have combined to degrade local propagation conditions yesterday. Similar conditions are expected for today. Conditions at Townsville appeared fair to normal yesterday.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

238. Landsat Transmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 10:54:32 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CL7nMx.5t0@bbc.co.uk>
Source record: 28142

I have seen the orbital elements for Landsat in this group. Does anyone know about the transmissions from this sat. Yes we have all seen the great pickies, but is it at all feasable for 'joe public' to receive and decode the info?

Has anyone got frequecies and info on the modulation?

John B

John.boyer@rd.eng.bbc.co.uk

239. ARLK006 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 13:34:38 UTC
From: w1aw-list-approval@world.std.com
Message-ID: <$arlk006.1994@ampr.org>
Source record: 28143
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK006
ARLK006 Keplerian data

ZCZC SK73
QST de W1AW
Keplerian Bulletin 6 ARLK006
From ARRL Headquarters
Newington, CT February 12, 1994
To all radio amateurs

SB KEP ARL ARLK006
ARLK006 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94040.06708801 -.00000148 00000-0 10000-3 0 2607
2 14129 27.2057 342.5166 6022455 153.1354 258.3191 2.05877972 80144
UO-11
1 14781U 84021B 94040.53052044 .00000322 00000-0 62635-4 0 6637
2 14781 97.7907 61.1932 0011408 323.9974 36.0464 14.69140692531560
RS-10/11
1 18129U 87054A 94040.55124186 .00000030 00000-0 16659-4 0 8605
2 18129 82.9210 63.1886 0012804 25.2124 334.9655 13.72330924332409
AO-13
1 19216U 88051B 94040.93964943 .00000390 00000-0 10000-4 0 8755
2 19216 57.8821 268.9522 7208878 334.5703 3.1370 2.09717918 43343
FO-20
1 20480U 90013C 94035.98074861 -.00000022 00000-0 31548-4 0 6561
2 20480 99.0184 212.8744 0540153 279.0888 74.9498 12.83223693187179
AO-21
1 21087U 91006A 94041.01003248 .00000094 00000-0 82657-4 0 4237
2 21087 82.9396 236.8134 0036944 77.6411 282.8874 13.74533854152118
RS-12/13
1 21089U 91007A 94040.58590730 .00000042 00000-0 27829-4 0 6615
2 21089 82.9204 106.0890 0030651 102.2186 258.2406 13.74034795151126
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000 0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
```

```
UO-14
1 20437U 90005B 94037.22619383 .00000077 00000-0 47034-4 0 9612
2 20437 98.5971 123.7526 0010334 214.1893 145.8624 14.29821595210876
AO-16
1 20439U 90005D 94037.21681236 .00000071 00000-0 44536-4 0 7626
2 20439 98.6031 124.8401 0010724 214.1741 145.8750 14.29877371210889
DO-17
1 20440U 90005E 94040.75231196 .00000060 00000-0 40428-4 0 7621
2 20440 98.6061 128.6181 0010852 203.0624 157.0068 14.30016024211408
WO-18
1 20441U 90005F 94037.22688753 .00000066 00000-0 42405-4 0 7628
2 20441 98.6048 125.1409 0011314 214.6745 145.3695 14.29991649210908
LO-19
1 20442U 90005G 94037.21376903 .00000072 00000-0 44757-4 0 7617
2 20442 98.6040 125.3540 0011701 213.9496 146.0939 14.30085714210913
UO-22
1 21575U 91050B 94040.70538846 .00000085 00000-0 43536-4 0 4637
2 21575 98.4469 117.7141 0007501 318.1128 41.9484 14.36888785134771
KO-23
1 22077U 92052B 94041.42783993 -.00000037 00000-0 10000-3 0 3583
2 22077 66.0820 185.3819 0009572 318.8321 41.1977 12.86284604 70485
AO-27
1 22825U 93061C 94037.24428981 .00000055 00000-0 40372-4 0 2598
2 22825 98.6630 114.3002 0008288 227.9109 132.1364 14.27605705 19007
IO-26
1 22826U 93061D 94037.72532850 .00000066 00000-0 44626-4 0 2603
2 22826 98.6651 114.7973 0008457 230.9496 129.0928 14.27708094 19076
KO-25
1 22830U 93061H 94040.70815228 .00000057 00000-0 40495-4 0 2625
2 22830 98.5680 116.3594 0011136 187.2116 172.8898 14.28032363 19500
POSAT
1 22829U 93061G 94037.20759234 .00000070 00000-0 45885-4 0 2520
2 22829 98.6603 114.2924 0009404 217.5862 142.4662 14.28001942 19004
MIR
1 16609U 86017A 94041.42205754 .00011161 00000-0 14078-3 0 1312
2 16609 51.6168 102.3559 0004327 318.6406 41.4259 15.60125914456273

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
February 15, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

240. * SpaceNews 14-Feb-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 18:31:26 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0214.1994@ampr.org>
Source record: 28144
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0214
* SpaceNews 14-Feb-94 *

BID: $SPC0214

=========
SpaceNews
=========

MONDAY FEBRUARY 14, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* STS-60/SAREX NEWS *
====================
Gustavo, LW2DTZ, has provided a copy of the packet transmissions he received
from the SAREX experiment carried on Shuttle missiom STS-60 on 06-Feb-94 at
06:56 UTC during a pass over Buenos Aires, Argentina:

W5RRR-1>QST <UI>:
Greetings from the crew of STS-60! Our current altitude is 190 nautOTRO
miles above the beautiful Earth that is the home for all of us. We are
very busy with Spacehab experiments and hopefully today we will deploy
the Wake Shield Facility.

W5RRR-1>QST <UI>:
Best wishes and poka!
Privet to MIR crew
Un afectuoso saludo a todos los radioaficionados hispanoamericanos desde el
transbordador espacial Discovery. Nuestra mision continua en su tercer dia.
hoy logramos avances importantes en la met

W5RRR-1>QST <UI>:
alurgia y la cristalizacion de
proteinas para usos medicos.

W5RRR-1>SAREX <UI>:
This is STS-60 SAREX Robot station W5RRR-1
onboard the Space Shuttle Discovery.

Those who have heard or worked the STS-60 crew and wish to receive a QSL
card need to send your signal report and an SASE or an envelope and IRCs to
the following address:

STS-60 QSL
Education Activities Division

ARRL
225 Main St
Newington, CT 06111
U.S.A.

In other STS-60 news, Yoshiro Yamada at the Yokohama Science Center in Japan reported observing STS-60 at a +1 magnitude on 06-Feb-94 at 05:43 JST from Yokohama.

Although several opportunities were available to see the Shuttle during the early morning hours from the east coast of the United States, observations in some areas were not possible due to thick cloud cover (and heavy snow!).

* DOVE POSTS FIRST CALLS *
==========
The first of 300 callsigns of amateurs who sent telemetry data to Junior PY2BJO in Brazil when DOVE was brought back on the air in December have been posted on the satellite downlink in between engineering data. The following was received by KA3AFY on Friday Feb. 4th, 1994 at 1606 UTC:

DOVE-1>BRAMST [00/00/00 02:38:32]:
4th Feb 1994

DOVE reports have been received from :

AA7WD AB6BC AD4FH CT1DNF CT1EAT CT1EEB
CT1ENC CT1ENQ CT1ERC CT1ETZ CT1EXL CT1EXT

These will change in 4 Days.

[vk7zbx]

Tune into DOVE to see if your call or the call of someone you know shows up on the telemetry being sent on 145.825 MHz. Telemetry data is no longer needed but signal reports, equipment being used to receive DOVE, and DOVE being received in classrooms would be appreciated by BRAMSAT and Junior PY2BJO owner of DOVE. Please send reports to:

Dr. Junior Torres De Castro (PY2BJO)
119 Macaubal
Sao Palo
Brazil 01254

Thanks to Jim White (WD0E) and the DOVE Team for making the bulletin information available. Consult your favorite tracking program or DOVE Watcher for orbit information. Keep your eyes to the skies!

[Info via Larry Lilly, KA3AFY, "DOVE Watcher"]

* ITAMSAT BBS OPENS *
==========
After the software crash occurred on the 7 December, the ITAMSAT (IO-26) Command team decided to delay the reloading of the code, to improve the onboard software and further analyze the Whole Orbit Data dumps, to better

understand the satellite motion and operation. On 06-Jan-94, the final version of the code was validated by the Command team and the BBS re-opened to all users. The housekeeping code (IHT ver 2.1) now has WOD capabilities and weekly data dumps will be taken without affecting the BBS operations. All users are reminded that the BBS callsign is ITMSAT-11 for Broadcast and ITMSAT-12 for uploads, and that the standard PB and PG ground software is needed for accessing the BBS. The downlink frequency is 435.867 MHz using BPSK at 1200 baud.

Enjoy ITAMSAT!

[Info via Alberto, I2KBD, of the ITAMSAT Command Team]

* NEW PICTURE ON AO-21 *
==========
The AO-21 satellite is transmitting a picture showing the launch of the satellite three years ago. The picture is in WEFAX format at 240 lpm. The current operating schedule is available in 1200 bps AFSK packet radio format every 10 minutes on the 145.987 MHz RUDAK-II downlink frequency:

RUDAK2>BEACON <UI>:
RUDAK-II Schedule: (down 145.987, up 435.016)
min/10 Beacon Mode
0..4 FM Repeater
5..7 WEFAX Picture
8..9 AFSK TLM

RUDAK2>BEACON <UI>:
++ Hi, this is the RUDAK-II experiment on AMSAT OSCAR 21 ++

[Info via Gustavo, LW2DTZ]

* OSCAR-13 BANDPASS *
==========
Ever wonder who is active on AMSAT-OSCAR-13? Sergio, IK5AAX, in Italy provides the following bandpass listing for the curious:

OSCAR 13 BANDPASS:

SATURDAY 05:
2238-145924 ZY0SK
2245-145915 A22BW
2312-145897 LI2OWG
2333-145912 8P6SM

SUNDAY 06:
0036-145899 TI5RLI
1904-145884 K4AK
2330-145888 ZY0SK

MONDAY 07:
0018-145899 TU2OJ
0759-145905 Z21HJ

[Info via Sergio, IK5AAX]

* FO-20 OPERATION SCHEDULE *
============================
The FO-20 operation schedule is follows. Analog transponder and digital
transponder will be ON for a week respectively as they were since last
December.

Analog mode:
09-Feb-94 07:15 UTC -to- 16-Feb-94 07:40 UTC
23-Feb-94 08:05 UTC -to- 02-Mar-94 06:40 UTC
09-Mar-94 07:05 UTC -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 UTC -to- 30-Mar-94 08:15 UTC

Digital mode:
Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
===========
Thanks to all those who sent QSL cards, letters, and messages of
appreciation regarding SpaceNews, especially:

HS1JAN KB2OPQ N2GJ DL3MFM AB4U IK5AAX VK5THA WA6LVE N0TCT
Dave Bondon

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX
--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

241. Shuttle Scatter???

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 18:36:51 UTC
From: BILLY@urhep.pas.rochester.edu
Message-ID: <1994Feb14.183651.3989@galileo.cc.rochester.edu>
Source record: 28145

Has anyone tried to make a contact by bouncing a signal off the ionized gasses surrounding the Shuttle as it re-enters? I assume it would work just like meteor-scatter, except it would be predictable. When there is a high-inclination orbit (like 57 degrees), a KSC landing puts the re-entry path over the middle of the US. Anyone want to try a VHF QSO?

-Bill VanRemmen
billy@urhep.pas.rochester.edu
URHEP::billy

My opinions. No one else's. Definitely not the U of R's.
==
"Experience should teach us to be most on our guard to protect liberty
when the government's purposes are beneficient . . . the greatest
dangers to liberty lurk in insidious encroachment by men of zeal, well
meaning but without understanding."
Justice Louis Brandeis
Olmstead vs. United States, United States Supreme Court, 1928
==

242. Daily IPS Report - 15 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-14 23:25:41 UTC
From: dave@eram.esi.com.au
Message-ID: <5185@eram.esi.com.au>
Source record: 28146
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 14 February 1994
Summary for 14 February and Forecast up to 17 February
IPS Warning 05 will be issued 15 Feb

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 101/049

1B. SOLAR FORECAST
15 February 16 February 17 February
Activity Very low Very low Very low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 100/048

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled to active, apart from
minor storm levels 15-18UT.

Estimated Indices : A K Observed A Index 13 February
Learmonth 25 4333 4544
Fredericksburg 25 30
Planetary 28 28

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
15 Feb 25 Unsettled to active levels, with occasional minor
storm periods.
16 Feb 20 Unsettled to active.
17 Feb 20 Unsettled to active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

14 Feb fair-normal fair poor
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
15 Feb fair-normal poor-fair poor
16 Feb normal fair poor-fair
17 Feb normal fair poor-fair
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values until 09UT, and
enhanced by 15-30% thereafter.

T index: 48

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
15 Feb 50 About 15% above predicted monthly values.
16 Feb 50 About 15% above predicted monthly values.
17 Feb 40 Near predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Intermittent Sporadic E layer, and continued geomagnetic activity,
may have combined to degrade local propagation conditions yesterday.
Similar conditions are expected for today. Conditions at Townsville
appeared fair to normal yesterday.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

243. APT-Satellites: Report FEB 14, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-02-15 09:12:21 UTC
From: peter.henne@gmd.de
Message-ID: <1994Feb15.091221.15034@gmd.de>
Source record: 28147
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, FEB 14, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)

Signal of Meteor 2-21 seems to become a bit stronger,
but remains weak compared to the other APT-Satellites.
Meteor 3-3, -4, -5 and -6 were inactive. The illumination-
conditions over the northern hemisphere slowly become
better, increasing the vis-contrast (exspecially for
NOAA-9). NOAA-11 drifted to late afternoon, passing
northbound roughly one hour west of the terminator at
50 deg NLat, the right parts of vis-images are quite dim.
```


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

244. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-15 11:32:19 UTC
From: nobody@pmantis.berkeley.edu
Message-ID: <9402151132.AA19009@pmantis.berkeley.edu>
Source record: 28148

::
subject: Introduction to Blacknet

Introduction to BlackNet

Your name has come to our attention. We have reason to believe you may be interested in the products and services our new organization, BlackNet, has to offer.

BlackNet is in the business of buying, selling, trading, and otherwise dealing with *information* in all its many forms.

We buy and sell information using public key cryptosystems with essentially perfect security for our customers. Unless you tell us who you are (please don't!) or inadvertently reveal information which provides clues, we have no way of identifying you, nor you us.

Our location in physical space is unimportant. Our location in cyberspace is all that matters. Our primary address is the PGP key location: "BlackNet<nowhere@cyberspace.nil>" and we can be contacted (preferably through a chain of anonymous remailers) by encrypting a message to our public key (contained below) and depositing this message in one of the several locations in cyberspace we monitor. Currently, we monitor the following location: the "Cypherpunks" mailing list (cypherpunks@toad.com).

BlackNet is nominally nondideological, but considers nation-states, export laws, patent laws, national security considerations and the like to be relics of the pre-cyberspace era. Export and patent laws are often used to explicity project national power and imperialist, colonialist state fascism. BlackNet believes it is solely the responsibility of a secret holder to keep that secret--not the responsibilty of the State, or of us, or of anyone else who may come into possession of that secret. If a secret's worth having, it's worth protecting.

BlackNet is currently building its information inventory. We are interested in information in the following areas, though any other juicy stuff is always welcome. "If you think it's valuable, offer it to us first."

- trade secrets, processes, production methods (esp. in semiconductors)
- nanotechnology and related techniques (esp. the Merkle sleeve bearing)
- chemical manufacturing and rational drug design (esp. fullerines and protein folding)
- new product plans, from children's toys to cruise missiles (anything on "3DO"?)
- business intelligence, mergers, buyouts, rumors

BlackNet can make anonymous deposits to the bank account of your choice, where local banking laws permit, can mail cash directly (you assume the risk of theft or seizure), or can credit you in "CryptoCredits," the internal currency of BlackNet (which you then might use to buy _other_ information and have it encrypted to your special public key and posted in public place).

If you are interested, do NOT attempt to contact us directly (you'll be wasting your time), and do NOT post anything that contains your name, your e-mail address, etc. Rather, compose your message, encrypt it with the public key of BlackNet (included below), and use an anonymous remailer chain of one or more links to post this encrypted, anonymized message in one of the locations listed (more will be added later). Be sure to describe what you are selling, what value you think it has, your payment terms, and, of course, a special public key (NOT the one you use in your ordinary business, of course!) that we can use to get back in touch with you. Then watch the same public spaces for a reply.

(With these remailers, local PGP encryption within the remailers, the use of special public keys, and the public postings of the encrypted messages, a secure, two-way, untraceable, and fully anonymous channel has been opened between the customer and BlackNet. This is the key to BlackNet.)

A more complete tutorial on using BlackNet will soon appear, in plaintext form, in certain locations in cyberspace.

Join us in this revolutionary--and profitable--venture.

BlackNet<nowhere@cyberspace.nil>

-----BEGIN PGP PUBLIC KEY BLOCK-----
Version: 2.2

mQA9Ai1bN6oAAAEBgM98haqmu+pqkoqkr95iMmBTNgb+iL54kUJCoBSOrT0Rqsmz
KHcVaQ+p4vLIWlrRawAFEbQgQmxhY2tOZXQ8bm93aGVyZUBjeWJlcnNwYWNlLm5p
bD4=
=yOMI
-----END PGP PUBLIC KEY BLOCK-----

245. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-02-15 12:00:25 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-761313621@unomaha.edu>
Source record: 28149
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

```
Posted-By: auto-faq 3.2.1.2
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info,
and rec.radio.swap newsgroups. It is intended to serve as a guide for the new
reader on what to find where. Questions and comments may be directed to the
author, Jay Maynard, K5ZC, by Internet electronic mail at
jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September
1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to
note the rmgroup of rec.radio.amateur.packet, and to officially retire some
(in)famous threads of discussion on rec.radio.amateur.policy.

History
=======

Way back when, before there was a Usenet, the Internet hosted a mailing list
for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions
were held on the mailing list, and sent to the mailboxes of those who had
signed up for it. When the Usenet software was created, and net news as we
now know it was developed, a newsgroup was created for hams: net.ham-radio.
The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began
to dominate other topics in the group and on the list. This resulted in the
logical solution: a group was created to hold the packet discussion, and
another corresponding mailing list was created as well: net.ham-radio.packet
and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great
Renaming essentially unchanged, moving from net.ham-radio[.packet] to
rec.ham-radio[.packet]. Readership and volume grew with the rest of the
network.

The INFO-HAMS mailing list was originally run from a US Army computer at
White Sands Missile Range, SIMTEL20. There were few problems with this
arrangement, but one was that the system was not supposed to be used for
commercial purposes. Since one of hams' favorite pastimes is swapping
gear, it was natural for hams to post messages about equipment for sale
to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use
restriction, and after some argument, a group was created specifically
```

for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
==========

Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

--
Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

246. Daily IPS Report - 16 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-15 23:59:16 UTC
From: dave@eram.esi.com.au
Message-ID: <5189@eram.esi.com.au>
Source record: 28150
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 15 February 1994
Summary for 15 February and Forecast up to 18 February
IPS Warning 05 was issued on 14 Feb and is still current.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 104/053

1B. SOLAR FORECAST
16 February 17 February 18 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 105/054

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled to active, apart from
minor storm levels 12-15UT.

Estimated Indices : A K Observed A Index 14 February
Learmonth 15 3334 5443
Fredericksburg 17 28
Planetary 20 28

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
16 Feb 20 Unsettled to active levels, with occasional minor
storm periods.
17 Feb 15 Unsettled to active.
18 Feb 10 Unsettled.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

15 Feb normal fair poor-fair
PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
16 Feb normal fair poor-fair
17 Feb normal normal fair
18 Feb normal normal fair
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 30-60% enhanced until 06UT, 15-30% enhanced
07-18UT, and near predicted monthly values thereafter.

T index: 72

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
16 Feb 30 Near predicted monthly values.
17 Feb 30 Near predicted monthly values.
18 Feb 30 Near predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Regular Sporadic E layer, and continued geomagnetic activity, may
have combined to degrade local propagation conditions yesterday.
Similar conditions are expected for today. Conditions at Townsville
appeared normal yesterday.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

247. Cable Before the PreAmp

Newsgroup: rec.radio.amateur.space
Date: 1994-02-16 11:45:57 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.87.761399157@UPEI.CA>
Source record: 28151

The system I am currently using has two omni directional antennas for 2 meters and 70 cm. The 70 cm antenna is the M Square egg beater and it is up about 20 feet - connected to the rig with Beldin 9913 via N connectors. I do okay on the 9.6 Kb birds: I can copy from an elevation of about 15 degrees (- can hear the bird at 2 degrees elevation) - but the signal is rarelyabove S1.5 on the IC475. Fortunately noise and interference is not a problemhere on the Island. BUT - as soon as it gets above freezing I plan to put a landwehr preamp up at the base of the antenna to improve the stations performance on receive.

My question is this:

What cable/coax should I use for the patch cable between the antenna and preamp. I would like to make the distance as short as possible - but too short and even RG213 will not make the turn to get to the preamp input without distorting the cable's properties. Is a 12 inch run of smaller cable bad news? Should I use a longer run ofRg 213 or 9913? What would have the least impact upon the preamp's performance?

I understand that flexible 9913 is used for the system using yagis - but there the patch cable is probably in excess of 10 feet depending on the setup. - Is flexi 9913 able to make a decent turn - so that a patch cable in an omni system is a reasonable size?

Thank you for any information you might be able to provide me on what is essentially a practical question.

73 David, VY2DCS

Internet: Seeler@upei.ca

248. Oscar 13 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-02-16 12:29:57 UTC
From: grib@esvx17.es.dupont.com
Message-ID: <1994Feb16.122957.22324@es.dupont.com>
Source record: 28152

Hi All,

As a "newbe" to satellite work, I am in the middle of assembling a Oscar 13 station. I have enough power/preamps/decent rigs for the 2 meter uplink and 435 downling (and vice versa). One thing I'm lacking is antennas for this effort. I already have the elevation rotor so I'm about ready to go. I've been looking into antennas, and need some info regarding them and circular polarization;

a) Is switchable polarization really necessary? Is there a "standard" polarization setting for the Oscar birds?

b) I have diagrams to build quagi's for satellite work. What is the current prices vs building a quagi like. I saw some ad's for KLM antennas, and if I remember correctly, the prices were like $150 + each. Even if I had to build a quagi a year, it would take me quite a bit of time to use up $150 worth of materials!!

c) I saw an article in either Jan or Feb QST regarding 2304 downlinks. Are they used very much? Is it worth the effort and cost to install a 2304 downlink? I live in a rather rural area, so 2 meter interference isn't really a problem here, but was trying to get a idea of the cost vs necessity of getting up on 2304.

Thanks and 73,

Joe KI3B

249. It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-16 13:34:10 UTC
From: lang@unb.ca
Message-ID: <ID0097.D940216.T092941.lang@unb.ca>
Source record: 28153
Cross-posted to: rec.boats,rec.radio.amateur.space

```
R 112045Z FEB 94
FM 2SOPS FALCON AFB CO//DOAI//
UNCLAS
NOTICE ADVISORY TO NAVSTAR USERS (NANU) 050-94042
SUBJ: ACTIVATION OF ANTI-SPOOFING (A/S)
1. CONDITION: A/S WAS ACTIVATED ON DAY 031 (JAN 31 94) AT 0000 UTC.
DUE TO THE 8 DEC 93 DECLARATION OF INITAL OPERATIONAL CAPABILITY
(IOC) THE P-CODE WILL NOT NORMALLY BE AVAILABLE TO USERS WHO DO NOT
HAVE VALID CRYPTOGRAPHIC KEYS (IAW FEDERAL RADIONAVIGATION PLAN
1992).
2. POC: CAPT THOMPSON AT (719) 550-6378 OR DSN 560-6378.
RECEIVED AT USNO 14 FEB 94
```


```
==============================================================================
Richard B. Langley Internet: LANG@UNB.CA or SE@UNB.CA
Geodetic Research Laboratory BITnet: LANG@UNB or SE@UNB
Dept. of Geodesy and Geomatics Engineering Phone: (506) 453-5142
University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
==============================================================================
```

250. Non-delivery Notification

Newsgroup: rec.radio.amateur.space
Date: 1994-02-16 16:14:54 UTC
From: postmaster@switch.CH
Message-ID: <199402161615.IAA07481@ucsd.edu>
Source record: 28154

Hi ham-space@UCSD.EDU !

this notification concerns your message with

msgid: "<199402101213.EAA01487@ucsd.edu>"

It could not be delivered to the following recipient(s):

hb9boj@hb9eh.ampr.org

In most cases, these delivery problems are caused by spelling errors in the
recipient addresses. This often happens when the FAX-Gateway is addressed.
Its correct addressing is:

X.400: /X121=9xxxxxxxx/ADMD=arcom/C=ch/
RFC-822: /X121=9xxxxxxxx/ADMD=arcom/C=ch/@chx400.switch.ch

Other reasons may be:

- non-authorized use of our gateway to ADMD=arcom: It is open for users with
X.400 addresses "...;PRMD=switch;ADMD=arcom;C=ch" *and* RFC-822 addresses
...@<somedomain>.ch only.

- an incorrectly encoded message envelope: Examples for this are missing
address attributes from some very old EAN versions.

- incorrect timezones in the header's tracing info:
We often see timezone +2900 (29 hours, 0 minutes ahead of Greenwich)
from Solaris 2.3 mailers. Some MTAs (like ADMD=arcom) refuse to accept
such messages. Please install improved sendmail binaries, available via
anonymous ftp from

host: nic.switch.ch
path: software/Solaris/inofficial-patch/sendmail2.3.2.tar.Z

Please contact your local postmaster if you cannot work out the problem
yourself !

postmaster@chx400.switch.ch

251. Re: It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-16 16:18:53 UTC
From: jpetith@phantom.com
Message-ID: <2jth1d$31g@dockmaster.phantom.com>
Source record: 28155
Cross-posted to: rec.boats,rec.radio.amateur.space

Can anyone translate the preceeding so that a mere mortal with
a GPS can understand its meaning???
.....Jack

252. Re: It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-16 21:14:49 UTC
From: stephens@geod.emr.ca
Message-ID: <stephens.761433289@ngis>
Source record: 28156
Cross-posted to: rec.boats,rec.radio.amateur.space

Anti spoofing is a system that degrades the GPS fixes of systems that
are not using the classified military codes for accurate, dynamic
navigation. i.e. to prevent anyone from using GPS as a means
of guiding weapons or aiming them.
Presumably 100 m is greater than the blast radius of a terrorist
bomb!

--
Dave Stephenson
Geological Survey of Canada *Too much bad arithmetic is not a *
Ottawa, Ontario, Canada *substitute for not enough good *
Internet: stephens@geod.emr.ca * mathematics *

253. Daily IPS Report - 17 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-17 00:11:53 UTC
From: dave@eram.esi.com.au
Message-ID: <5193@eram.esi.com.au>
Source record: 28157
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 16 February 1994
Summary for 16 February and Forecast up to 19 February
IPS Warning 05 was issued on 14 Feb and is still current.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 105/054

1B. SOLAR FORECAST
17 February 18 February 19 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 105/054

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled to active

Estimated Indices : A K Observed A Index 15 February
Learmonth 12 3311 4331
Fredericksburg 17 26
Planetary 18 18

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
17 Feb 15 Unsettled to active.
18 Feb 10 Unsettled.
19 Feb 07 Quiet to unsettled.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
16 Feb normal normal fair-normal
PCA Event : None.

3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
17 Feb normal normal fair
18 Feb normal normal fair
19 Feb normal normal normal
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values with spread F
during local night.

T index: 41

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
17 Feb 50 Near predicted monthly values.
18 Feb 50 Near predicted monthly values.
19 Feb 45 Near predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

254. Re: It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-17 02:11:28 UTC
From: dprsm@ux5.lbl.gov
Message-ID: <2jujog$b1h@overload.lbl.gov>
Source record: 28158
Cross-posted to: rec.boats,rec.radio.amateur.space

What is anti-spoofing? Does this mean that we are now getting a
scrambled signal? (which I think we've been getting all along?);
or does it mean that the powers-that-be have come to their senses
and turned off the signal jitter?

255. MIR frequencies, AM or FM ?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-17 14:05:57 UTC
From: elendir@enst.fr
Message-ID: <2jvtk5$fu5@cismsun.univ-lyon1.fr>
Source record: 28159

Hello,
I've heard that the MIR station used the 143.625 MHz for Earth control.
Do you know which mode they use ? AM, FM or SSB ?

Thanks for any info,
Vince (11 weeks and waiting ...)

--

256. Re: Daily IPS Report - 11 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-17 14:58:56 UTC
From: jmvasnie@cen.ex.ac.uk
Message-ID: <CLDIy8.7HG@cen.ex.ac.uk>
Source record: 28160
Cross-posted to: aus.radio,rec.radio.amateur.space

dave@eram.esi.com.au writes:
> IPS RADIO AND SPACE SERVICES AUSTRALIA
> Daily Solar And Geophysical Report
> Issued at 2330 UT 10 February 1994
> Summary for 10 February and Forecast up to 13 February
> IPS Warning 03 was issued on 03 Feb and expires today.
> --
>
> 1A. SOLAR SUMMARY
> Activity: low
>
> Flares: none.
>
> Observed 10.7 cm flux/Equivalent Sunspot Number : 094/040
>
> 1B. SOLAR FORECAST
> 11 February 12 February 13 February
> Activity Low Low to moderate Low to moderate
> Fadeouts None expected None expected None expected
>
> Forecast 10.7 cm flux/Equivalent Sunspot Number : 090/034
>
> 1C. SOLAR COMMENT
> Previously flaring region (M class) has yet to appear.
> --
>
> 2A. MAGNETIC SUMMARY
> Geomagnetic field at Learmonth : ???
>
> Estimated Indices : A K Observed A Index 9 February
> Learmonth 21 3333 5442
> Fredericksburg 27 32
> Planetary 30 34
>
>
> 2B. MAGNETIC FORECAST
> DATE Ap CONDITIONS
> 11 Feb 20 Active.
> 12 Feb 20 Active.
> 13 Feb 20 Active.
>
> 2C. MAGNETIC COMMENT
> Magnetic activity did not decline as expected, futher active periods

> are now expected. Another recurrent disturbance is expected Feb
> 14-15.
>
> 3A. GLOBAL HF PROPAGATION SUMMARY
> LATITUDE BAND
> DATE LOW MIDDLE HIGH
> 10 Feb fair-normal fair-normal poor-fair
> PCA Event : None.
> 3B. GLOBAL HF PROPAGATION FORECAST
> LATITUDE BAND
> DATE LOW MIDDLE HIGH
> 11 Feb normal fair poor
> 12 Feb normal fair poor
> 13 Feb normal fair poor
> 3C. GLOBAL HF PROPAGATION COMMENT
> Propagation conditions are now expected to remain fair for
> mid lats and fair-poor at high lats until Feb 16.
>
> --
>
> 4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
> MUFs at Sydney were about 15% below predicted monthly values
>
> T index: -4
>
> 4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
> DATE T-index MUFs
> 11 Feb 10 10 to 15% below predicted monthly values.
> 12 Feb 20 About 10% below predicted monthly values.
> 13 Feb 20 About 10% below predicted monthly values.
>
> Predicted Monthly T Index for February is 30.
>
> 4C. AUSTRALIAN REGION COMMENT
> Ionosphere did not recover as expected yesterday, probably due
> to continuing magnetic activity. Another disturbed period is
> expected Feb 14-16.
> --
> Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
> dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

257. WANTED: Circuit to switch out preamp on transmit

Newsgroup: rec.radio.amateur.space
Date: 1994-02-17 15:58:21 UTC
From: dquaglia@cbnewsj.cb.att.com
Message-ID: <CLDLpE.GG1@cbnewsj.cb.att.com>
Source record: 27911

I'm looking for a circuit that will detect the presence of RF and
switch out a preamp. I only have a transceiver and I would like to
put the preamp on the mast, but I know the preamp will get fried unless
I put some sort of protection on it. I've heard there is a simple
way to do this with PIN diodes, but I can't find any references to this
in any of my usual sources. Any help is appreciated.

Replies to dquaglia@cbnewsj.cb.att.com or dquagliana@attmail.com.

Douglas Quagliana KA2UPW
dquaglia@cbnewsj.cb.att.com

258. Daily IPS Report - 18 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 01:01:18 UTC
From: dave@eram.esi.com.au
Message-ID: <5195@eram.esi.com.au>
Source record: 27912
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 17 February 1994
Summary for 17 February and Forecast up to 20 February
IPS Warning 06 was issued on 17 Feb and is current for
20-23 Feb.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 106/055

1B. SOLAR FORECAST
18 February 19 February 20 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet to unsettled

Estimated Indices : A K Observed A Index 16 February
Learmonth 10 2222 3332
Fredericksburg 12 16
Planetary 10 15

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
18 Feb 10 Quiet to unsettled.
19 Feb 12 Quiet to unsettled.
20 Feb 18 Unsettled to active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
17 Feb normal normal fair-normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
18 Feb normal normal fair
19 Feb normal normal fair
20 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 10 to 15% above predicted monthly values

T index: 54

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
18 Feb 55 About 15% above predicted monthly values.
19 Feb 50 About 10% above predicted monthly values.
20 Feb 20 About 15% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

259. Weekly IPS Report - 18 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 01:02:03 UTC
From: dave@eram.esi.com.au
Message-ID: <5196@eram.esi.com.au>
Source record: 27913
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

11 FEBRUARY - 17 FEBRUARY 1994

Issue No 07
Date of issue: 18 February, 1994

INDICES:
Date 11 12 13 14 15 16 17
10cm 093 098 098 101 104 105 106
A 38 27 30 28 26 16 (12)
T 20 26 36 48 72 41 54

SUMMARY OF ACTIVITY

February 11
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled 00-09 and
21-24UT, and at storm levels at other times.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values, with Sporadic E blanketing at 08UT.

February 12
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled to active,
apart from minor storm levels 12-15UT.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values

February 13
Solar activity was low.
The geomagnetic field at Learmonth (WA) was unsettled to active,
apart from minor storm levels 18-21UT.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values until 16UT, apart from enhancements of 15-40% from
11-15UT, and 15-30% depressed from 17UT onwards.

February 14
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled to active,
apart from minor storm levels 15-18UT.
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values until 09UT, and enhanced by 15-30% thereafter.

.SK
February 15
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled to active,

apart from minor storm levels 12-15UT.
Ionospheric F2 critical frequencies at Sydney were 30-60% enhanced
until 06UT, 15-30% enhanced 07-18UT, and near predicted monthly
values thereafter.

February 16
Solar activity was very low.
The geomagnetic field at Learmonth (WA) was unsettled to active
Ionospheric F2 critical frequencies at Sydney were near predicted
monthly values with spread F during local night.

February 17
Solar activity was low.
The geomagnetic field at Learmonth (WA) was quiet to unsettled
Ionospheric F2 critical frequencies at Sydney were 10 to 15% above
predicted monthly values

FORECAST FOR THE NEXT WEEK (18 - 24 FEBRUARY)

SOLAR: low

GEOMAGNETIC: active 20-23 Feb due to a coronal hole

IONOSPHERIC: near predicted monthly values, MUFs are then expected
to be depressed 15-20% during the coronal hole activity
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

260. Re: Daily IPS Report - 11 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 02:09:56 UTC
From: dave@eram.esi.com.au
Message-ID: <5198@eram.esi.com.au>
Source record: 27914
Cross-posted to: aus.radio,rec.radio.amateur.space

In article <CLDIy8.7HG@cen.ex.ac.uk>,
jmvasnie@cen.ex.ac.uk writes:

| dave@eram.esi.com.au writes:
| > IPS RADIO AND SPACE SERVICES AUSTRALIA
| > Daily Solar And Geophysical Report
| > Issued at 2330 UT 10 February 1994
| > Summary for 10 February and Forecast up to 13 February

[Entire report deleted]

Yes, I did write that...

--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

261. Re: It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 11:14:55 UTC
From: ae674@yfn.ysu.edu
Message-ID: <2k27vf$86g@news.ysu.edu>
Source record: 27915

:Anti spoofing is a system that degrades the GPS fixes of systems that
:are not using the classified military codes for accurate, dynamic
:navigation. i.e. to prevent anyone from using GPS as a means
:of guiding weapons or aiming them.
:Presumably 100 m is greater than the blast radius of a terrorist
:bomb!

I presume this randomizes the timing signals that are sent and received...
I was under the impression that this had been implemented a while ago.
Or is "anti spoofing" a more secure encryption scheme for the military coded signals?
Having yet to get my hands on a GPS unit, what kind of resolution do the commercial
units offer and what was there accuracy before the "anti spoofing"/signal jitter
system went into effect?

262. ORBS$049.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 13:34:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-049.o.1994@ampr.org>
Source record: 27916
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-049.O
Orbital Elements 049.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SAT
FROM WA5QGD FORT WORTH,TX February 18, 1994
BID: $ORBS-049.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94041.03785160
Element set: 261
Inclination: 27.2065 deg
RA of node: 342.3641 deg
Eccentricity: 0.6022608
Arg of perigee: 153.3557 deg
Mean anomaly: 257.8051 deg
Mean motion: 2.05878353 rev/day
Decay rate: -1.38e-06 rev/day^2
Epoch rev: 8016
Checksum: 280

Satellite: UO-11
Catalog number: 14781
Epoch time: 94044.54889300
Element set: 664
Inclination: 97.7907 deg
RA of node: 65.0254 deg
Eccentricity: 0.0011279
Arg of perigee: 310.7761 deg
Mean anomaly: 49.2455 deg
Mean motion: 14.69144313 rev/day
Decay rate: 3.63e-06 rev/day^2
Epoch rev: 53215
Checksum: 306

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94047.04020088
Element set: 863
Inclination: 082.9204 deg
RA of node: 058.3872 deg
Eccentricity: 0.0011757
Arg of perigee: 005.5029 deg
```

Mean anomaly: 354.6799 deg
Mean motion: 13.72331248 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 33329
Checksum: 301

Satellite: AO-13
Catalog number: 19216
Epoch time: 94046.66135778
Element set: 879
Inclination: 057.8129 deg
RA of node: 267.9831 deg
Eccentricity: 0.7205073
Arg of perigee: 334.9717 deg
Mean anomaly: 002.9154 deg
Mean motion: 02.09729204 rev/day
Decay rate: 2.242e-05 rev/day^2
Epoch rev: 4346
Checksum: 331

Satellite: FO-20
Catalog number: 20480
Epoch time: 94046.42832899
Element set: 659
Inclination: 99.0216 deg
RA of node: 221.3367 deg
Eccentricity: 0.0539917
Arg of perigee: 255.4010 deg
Mean anomaly: 98.6634 deg
Mean motion: 12.83223845 rev/day
Decay rate: -1.4e-07 rev/day^2
Epoch rev: 18851
Checksum: 320

Satellite: AO-21
Catalog number: 21087
Epoch time: 94044.50409244
Element set: 424
Inclination: 82.9374 deg
RA of node: 234.2226 deg
Eccentricity: 0.0036823
Arg of perigee: 68.1133 deg
Mean anomaly: 292.3931 deg
Mean motion: 13.74534088 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 15259
Checksum: 296

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94044.66379265

Element set: 662
Inclination: 82.9220 deg
RA of node: 103.0678 deg
Eccentricity: 0.0030946
Arg of perigee: 91.8517 deg
Mean anomaly: 268.6203 deg
Mean motion: 13.74034946 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 15168
Checksum: 314

Satellite: ARSENE
Catalog number: 22654
Epoch time: 93338.80803910
Element set: 243
Inclination: 1.4104 deg
RA of node: 113.5274 deg
Eccentricity: 0.2936576
Arg of perigee: 161.9838 deg
Mean anomaly: 210.8642 deg
Mean motion: 1.42202044 rev/day
Decay rate: -8.7e-07 rev/day^2
Epoch rev: 299
Checksum: 278

/EX

263. ORBS$049.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 13:37:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-049.d.1994@ampr.org>
Source record: 27917
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-049.D
Orbital Elements 049.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX February 18, 1994
BID: $ORBS-049.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94046.18347456
Element set: 964
Inclination: 98.5953 deg
RA of node: 132.5942 deg
Eccentricity: 0.0010599
Arg of perigee: 186.2827 deg
Mean anomaly: 173.8225 deg
Mean motion: 14.29823413 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21215
Checksum: 317

Satellite: AO-16
Catalog number: 20439
Epoch time: 94045.75388848
Element set: 764
Inclination: 98.6038 deg
RA of node: 133.2765 deg
Eccentricity: 0.0010934
Arg of perigee: 188.0238 deg
Mean anomaly: 172.0765 deg
Mean motion: 14.29879034 rev/day
Decay rate: 7.6e-07 rev/day^2
Epoch rev: 21210
Checksum: 328

Satellite: DO-17
Catalog number: 20440
Epoch time: 94045.23034447
Element set: 763
Inclination: 98.6058 deg
RA of node: 133.0443 deg
Eccentricity: 0.0010965
Arg of perigee: 189.4352 deg
```

Mean anomaly: 170.6623 deg
Mean motion: 14.30017107 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 21204
Checksum: 266

Satellite: WO-18
Catalog number: 20441
Epoch time: 94045.76328214
Element set: 765
Inclination: 98.6054 deg
RA of node: 133.5798 deg
Eccentricity: 0.0011505
Arg of perigee: 188.3662 deg
Mean anomaly: 171.7330 deg
Mean motion: 14.29993172 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 21212
Checksum: 309

Satellite: LO-19
Catalog number: 20442
Epoch time: 94045.74960276
Element set: 763
Inclination: 98.6048 deg
RA of node: 133.7927 deg
Eccentricity: 0.0011921
Arg of perigee: 187.6862 deg
Mean anomaly: 172.4137 deg
Mean motion: 14.30087334 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 21213
Checksum: 308

Satellite: UO-22
Catalog number: 21575
Epoch time: 94046.13690949
Element set: 465
Inclination: 98.4466 deg
RA of node: 123.0432 deg
Eccentricity: 0.0007219
Arg of perigee: 301.1937 deg
Mean anomaly: 58.8542 deg
Mean motion: 14.36890610 rev/day
Decay rate: 1.13e-06 rev/day^2
Epoch rev: 13555
Checksum: 302

Satellite: KO-23
Catalog number: 22077
Epoch time: 94046.40390865

Element set: 360
Inclination: 66.0810 deg
RA of node: 174.9628 deg
Eccentricity: 0.0009874
Arg of perigee: 317.5713 deg
Mean anomaly: 42.4539 deg
Mean motion: 12.86284764 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7112
Checksum: 311

Satellite: AO-27
Catalog number: 22825
Epoch time: 94046.21545311
Element set: 261
Inclination: 98.6626 deg
RA of node: 123.1936 deg
Eccentricity: 0.0008062
Arg of perigee: 202.2052 deg
Mean anomaly: 157.8775 deg
Mean motion: 14.27607193 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 2028
Checksum: 289

Satellite: IO-26
Catalog number: 22826
Epoch time: 94042.21058899
Element set: 261
Inclination: 98.6649 deg
RA of node: 119.2441 deg
Eccentricity: 0.0008529
Arg of perigee: 216.1988 deg
Mean anomaly: 143.8612 deg
Mean motion: 14.27708814 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 1971
Checksum: 325

Satellite: KO-25
Catalog number: 22830
Epoch time: 94045.75293537
Element set: 264
Inclination: 98.5674 deg
RA of node: 121.3071 deg
Eccentricity: 0.0011406
Arg of perigee: 172.0390 deg
Mean anomaly: 188.0975 deg
Mean motion: 14.28033386 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 2022

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Checksum: 286

/EX
```

264. ORBS$049.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 13:39:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-049.w.1994@ampr.org>
Source record: 27918
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-049.W
Orbital Elements 049.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SAT
FROM WA5QGD FORT WORTH,TX February 18, 1994
BID: $ORBS-049.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94048.05740928
Element set: 717
Inclination: 099.0629 deg
RA of node: 097.0472 deg
Eccentricity: 0.0014834
Arg of perigee: 198.2531 deg
Mean anomaly: 161.8614 deg
Mean motion: 14.13588676 rev/day
Decay rate: 1.08e-06 rev/day^2
Epoch rev: 47337
Checksum: 335

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94048.07887430
Element set: 615
Inclination: 098.5086 deg
RA of node: 060.7353 deg
Eccentricity: 0.0013148
Arg of perigee: 322.0632 deg
Mean anomaly: 038.0209 deg
Mean motion: 14.24865197 rev/day
Decay rate: 1.92e-06 rev/day^2
Epoch rev: 38550
Checksum: 313

Satellite: MET
Catalog number: 18820
Epoch time: 94046.33979358
Element set: 262
Inclination: 82.5401 deg
RA of node: 5.5070 deg
Eccentricity: 0.0016642
Arg of perigee: 157.5160 deg
```

Mean anomaly: 202.6730 deg
Mean motion: 13.84706663 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 30549
Checksum: 289

Satellite: MET
Catalog number: 19336
Epoch time: 94039.99790931
Element set: 262
Inclination: 82.5380 deg
RA of node: 54.3969 deg
Eccentricity: 0.0015730
Arg of perigee: 222.0779 deg
Mean anomaly: 137.9138 deg
Mean motion: 13.16964807 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26638
Checksum: 335

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94046.98300494
Element set: 521
Inclination: 099.1592 deg
RA of node: 032.9867 deg
Eccentricity: 0.0011924
Arg of perigee: 112.3219 deg
Mean anomaly: 247.9779 deg
Mean motion: 14.12958217 rev/day
Decay rate: -9.6e-07 rev/day^2
Epoch rev: 27810
Checksum: 325

Satellite: MET
Catalog number: 19851
Epoch time: 94044.55769401
Element set: 262
Inclination: 82.5198 deg
RA of node: 242.4732 deg
Eccentricity: 0.0011047
Arg of perigee: 225.2162 deg
Mean anomaly: 134.8075 deg
Mean motion: 13.84359023 rev/day
Decay rate: 1.07e-06 rev/day^2
Epoch rev: 25058
Checksum: 297

Satellite: MET
Catalog number: 20305
Epoch time: 94046.12070456

Element set: 987
Inclination: 82.5552 deg
RA of node: 354.3730 deg
Eccentricity: 0.0006056
Arg of perigee: 241.9787 deg
Mean anomaly: 118.0703 deg
Mean motion: 13.04413574 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 20698
Checksum: 291

Satellite: MET
Catalog number: 20670
Epoch time: 94040.79306496
Element set: 762
Inclination: 82.5504 deg
RA of node: 309.6649 deg
Eccentricity: 0.0016176
Arg of perigee: 139.0978 deg
Mean anomaly: 221.1403 deg
Mean motion: 13.84188455 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18299
Checksum: 328

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94046.23594868
Element set: 892
Inclination: 98.8422 deg
RA of node: 70.2522 deg
Eccentricity: 0.0014658
Arg of perigee: 354.4648 deg
Mean anomaly: 5.6337 deg
Mean motion: 14.01322369 rev/day
Decay rate: -2.54e-06 rev/day^2
Epoch rev: 17662
Checksum: 323

Satellite: MET
Catalog number: 20826
Epoch time: 94045.22593445
Element set: 762
Inclination: 82.5209 deg
RA of node: 243.8029 deg
Eccentricity: 0.0014675
Arg of perigee: 36.2160 deg
Mean anomaly: 323.9979 deg
Mean motion: 13.83572388 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 17075

Checksum: 317

Satellite: MET
Catalog number: 21232
Epoch time: 94044.59202931
Element set: 670
Inclination: 82.5391 deg
RA of node: 256.9674 deg
Eccentricity: 0.0013673
Arg of perigee: 130.9218 deg
Mean anomaly: 229.3059 deg
Mean motion: 13.16460015 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13509
Checksum: 285

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94039.95700562
Element set: 919
Inclination: 98.6320 deg
RA of node: 70.4809 deg
Eccentricity: 0.0012014
Arg of perigee: 247.6730 deg
Mean anomaly: 112.3172 deg
Mean motion: 14.22366100 rev/day
Decay rate: 1.36e-06 rev/day^2
Epoch rev: 14230
Checksum: 260

Satellite: MET
Catalog number: 21655
Epoch time: 94046.41312719
Element set: 667
Inclination: 82.5533 deg
RA of node: 202.7275 deg
Eccentricity: 0.0013636
Arg of perigee: 137.2394 deg
Mean anomaly: 222.9769 deg
Mean motion: 13.16827457 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12043
Checksum: 304

Satellite: MET
Catalog number: 22782
Epoch time: 94047.11395079
Element set: 263
Inclination: 082.5509 deg
RA of node: 302.3850 deg
Eccentricity: 0.0021878

```
Arg of perigee: 203.9744 deg
Mean anomaly: 156.0899 deg
Mean motion: 13.83000458 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 02335
Checksum: 310

/EX
```

265. ORBS$049.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 13:41:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-049.m.1994@ampr.org>
Source record: 27919
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-049.M
Orbital Elements 049.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SAT
FROM WA5QGD FORT WORTH,TX February 18, 1994
BID: $ORBS-049.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94045.75585944
Element set: 254
Inclination: 98.6608 deg
RA of node: 122.7699 deg
Eccentricity: 0.0009759
Arg of perigee: 191.0097 deg
Mean anomaly: 169.0872 deg
Mean motion: 14.28003980 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 2022
Checksum: 326

Satellite: MIR
Catalog number: 16609
Epoch time: 94048.08346927
Element set: 140
Inclination: 051.6194 deg
RA of node: 068.8223 deg
Eccentricity: 0.0005218
Arg of perigee: 334.0639 deg
Mean anomaly: 026.0757 deg
Mean motion: 15.60261716 rev/day
Decay rate: 1.0503e-04 rev/day^2
Epoch rev: 45731
Checksum: 288

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94045.21686181
Element set: 437
Inclination: 28.4690 deg
RA of node: 305.8162 deg
Eccentricity: 0.0006080
Arg of perigee: 238.3563 deg
```

Mean anomaly: 121.6440 deg
Mean motion: 14.90475490 rev/day
Decay rate: 1.057e-05 rev/day^2
Epoch rev: 1102
Checksum: 268

Satellite: GRO
Catalog number: 21225
Epoch time: 94045.19676059
Element set: 66
Inclination: 28.4619 deg
RA of node: 5.5021 deg
Eccentricity: 0.0003857
Arg of perigee: 262.4247 deg
Mean anomaly: 97.5914 deg
Mean motion: 15.40075712 rev/day
Decay rate: 4.645e-05 rev/day^2
Epoch rev: 3795
Checksum: 300

Satellite: UARS
Catalog number: 21701
Epoch time: 94043.59286458
Element set: 478
Inclination: 56.9850 deg
RA of node: 298.3343 deg
Eccentricity: 0.0004571
Arg of perigee: 105.6879 deg
Mean anomaly: 254.4667 deg
Mean motion: 14.96334686 rev/day
Decay rate: 4.144e-05 rev/day^2
Epoch rev: 13228
Checksum: 336

/EX

266. ORBS$049.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 13:43:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-049.n.1994@ampr.org>
Source record: 27920
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-049.N
2Line Orbital Elements 049.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SAT
FROM WA5QGD FORT WORTH,TX February 18, 1994
BID: $ORBS-049.N

DECODE 2-LINE ELSETS WIT
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94041.03785160 -.00000138 00000-0 10000-3 0 2618
2 14129 27.2065 342.3641 6022608 153.3557 257.8051 2.05878353 80161
UO-11
1 14781U 84021B 94044.54889300 .00000363 00000-0 69607-4 0 6647
2 14781 97.7907 65.0254 0011279 310.7761 49.2455 14.69144313532150
RS-10/11
1 18129U 87054 A 94047.04020088 .00000024 00000-0 26346-4 0 8632
2 18129 082.9204 058.3872 0011757 005.5029 354.6799 13.72331248333290
AO-13
1 19216U 88051 B 94046.66135778 .00002242 00000-0 12555 0 0 8791
2 19216 057.8129 267.9831 7205073 334.9717 002.9154 02.09729204 43460
FO-20
1 20480U 90013C 94046.42832899 -.00000014 00000-0 49346-4 0 6594
2 20480 99.0216 221.3367 0539917 255.4010 98.6634 12.83223845188515
AO-21
1 21087U 91006A 94044.50409244 .00000094 00000-0 82657-4 0 4241
2 21087 82.9374 234.2226 0036823 68.1133 292.3931 13.74534088152592
RS-12/13
1 21089U 91007A 94044.66379265 .00000043 00000-0 29527-4 0 6625
2 21089 82.9220 103.0678 0030946 91.8517 268.6203 13.74034946151682
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000 0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
UO-14
1 20437U 90005B 94046.18347456 .00000060 00000-0 40471-4 0 9649
2 20437 98.5953 132.5942 0010599 186.2827 173.8225 14.29823413212157
AO-16
1 20439U 90005D 94045.75388848 .00000076 00000-0 46533-4 0 7643
```

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2 20439 98.6038 133.2765 0010934 188.0238 172.0765 14.29879034212109
DO-17
1 20440U 90005E 94045.23034447 .00000070 00000-0 44132-4 0 7637
2 20440 98.6058 133.0443 0010965 189.4352 170.6623 14.30017107212047
WO-18
1 20441U 90005F 94045.76328214 .00000059 00000-0 39826-4 0 7657
2 20441 98.6054 133.5798 0011505 188.3662 171.7330 14.29993172212124
LO-19
1 20442U 90005G 94045.74960276 .00000064 00000-0 41740-4 0 7638
2 20442 98.6048 133.7927 0011921 187.6862 172.4137 14.30087334212130
UO-22
1 21575U 91050B 94046.13690949 .00000113 00000-0 52716-4 0 4657
2 21575 98.4466 123.0432 0007219 301.1937 58.8542 14.36890610135556
KO-23
1 22077U 92052B 94046.40390865 -.00000037 00000-0 10000-3 0 3601
2 22077 66.0810 174.9628 0009874 317.5713 42.4539 12.86284764 71129
AO-27
1 22825U 93061C 94046.21545311 .00000058 00000-0 41460-4 0 2617
2 22825 98.6626 123.1936 0008062 202.2052 157.8775 14.27607193 20284
IO-26
1 22826U 93061D 94042.21058899 .00000053 00000-0 39268-4 0 2612
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
KO-25
1 22830U 93061H 94045.75293537 .00000053 00000-0 38624-4 0 2647
2 22830 98.5674 121.3071 0011406 172.0390 188.0975 14.28033386 20227
NOAA-9
1 15427U 84123 A 94048.05740928 .00000108 00000-0 57386-4 0 7177
2 15427 099.0629 097.0472 0014834 198.2531 161.8614 14.13588676473374
NOAA-10
1 16969U 86073 A 94048.07887430 .00000192 00000-0 82625-4 0 6151
2 16969 098.5086 060.7353 0013148 322.0632 038.0209 14.24865197385508
MET-2/17
1 18820U 88005A 94046.33979358 .00000030 00000-0 12997-4 0 2628
2 18820 82.5401 5.5070 0016642 157.5160 202.6730 13.84706663305497
MET-3/2
1 19336U 88064A 94039.99790931 .00000051 00000-0 10000-3 0 2623
2 19336 82.5380 54.3969 0015730 222.0779 137.9138 13.16964807266383
NOAA-11
1 19531U 88089 A 94046.98300494 -.00000096 00000-0 00000 0 0 5218
2 19531 099.1592 032.9867 0011924 112.3219 247.9779 14.12958217278100
MET-2/18
1 19851U 89018A 94044.55769401 .00000107 00000-0 82803-4 0 2624
2 19851 82.5198 242.4732 0011047 225.2162 134.8075 13.84359023250582
MET-3/3
1 20305U 89086A 94046.12070456 .00000044 00000-0 10000-3 0 9878
2 20305 82.5552 354.3730 0006056 241.9787 118.0703 13.04413574206986
MET-2/19
1 20670U 90057A 94040.79306496 .00000024 00000-0 79036-5 0 7621
2 20670 82.5504 309.6649 0016176 139.0978 221.1403 13.84188455182995
FY-1/2
```

```
1 20788U 90081A 94046.23594868 -.00000254 00000-0 -14043-3 0 8921
2 20788 98.8422 70.2522 0014658 354.4648 5.6337 14.01322369176623
MET-2/20
1 20826U 90086A 94045.22593445 .00000017 00000-0 15837-5 0 7622
2 20826 82.5209 243.8029 0014675 36.2160 323.9979 13.83572388170755
MET-3/4
1 21232U 91030A 94044.59202931 .00000051 00000-0 10000-3 0 6701
2 21232 82.5391 256.9674 0013673 130.9218 229.3059 13.16460015135098
NOAA-12
1 21263U 91032A 94039.95700562 .00000136 00000-0 80464-4 0 9196
2 21263 98.6320 70.4809 0012014 247.6730 112.3172 14.22366100142301
MET-3/5
1 21655U 91056A 94046.41312719 .00000051 00000-0 10000-3 0 6673
2 21655 82.5533 202.7275 0013636 137.2394 222.9769 13.16827457120431
MET-2/21
1 22782U 93055 A 94047.11395079 .00000069 00000-0 63374-4 0 2638
2 22782 082.5509 302.3850 0021878 203.9744 156.0899 13.83000458023351
POSAT
1 22829U 93061G 94045.75585944 .00000072 00000-0 46760-4 0 2541
2 22829 98.6608 122.7699 0009759 191.0097 169.0872 14.28003980 20229
MIR
1 16609U 86017 A 94048.08346927 .00010503 00000-0 12582-3 0 1406
2 16609 051.6194 068.8223 0005218 334.0639 026.0757 15.60261716457315
HUBBLE
1 20580U 90037B 94045.21686181 .00001057 00000-0 90647-4 0 4379
2 20580 28.4690 305.8162 0006080 238.3563 121.6440 14.90475490 11020
GRO
1 21225U 91027B 94045.19676059 .00004645 00000-0 10629-3 0 661
2 21225 28.4619 5.5021 0003857 262.4247 97.5914 15.40075712 37958
UARS
1 21701U 91063B 94043.59286458 .00004144 00000-0 38419-3 0 4780
2 21701 56.9850 298.3343 0004571 105.6879 254.4667 14.96334686132281
/EX
```

267. Re: It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 17:37:52 UTC
From: stephens@geod.emr.ca
Message-ID: <stephens.761593072@ngis>
Source record: 27921

ae674@yfn.ysu.edu (Reid Savage) writes:

>:Anti spoofing is a system that degrades the GPS fixes of systems that
>:are not using the classified military codes for accurate, dynamic
>:navigation. i.e. to prevent anyone from using GPS as a means
>:of guiding weapons or aiming them.
>:Presumably 100 m is greater than the blast radius of a terrorist
>:bomb!
>
> I presume this randomizes the timing signals that are sent and received...
> I was under the impression that this had been implemented a while ago.
> Or is "anti spoofing" a more secure encryption scheme for the military coded signals?
> Having yet to get my hands on a GPS unit, what kind of resolution do the commercial
> units offer and what was there accuracy before the "anti spoofing"/signal jitter
> system went into effect?

Crudely it is a deliberately introduced signal jitter. Up to now with
GPS 'non-operational' the anti-spoof was switched in and out as the
military operations needed it. The official dynamic precision is 100m,
Problem was that technology was advancing too fast and without some
form of deliberate degradion civilian systems even without the secret
timing codes could have accuracies that worried the operators of GPS.
Now the system is operational the operators will make efforts to ensure
that any new improvement in dynamic accuracy is deliberately degraded
back to spec. . Differential GPS that compares two stations, one
a known site is another game of course.

--
Dave Stephenson
Geological Survey of Canada *Too much bad arithmetic is not a *
Ottawa, Ontario, Canada *substitute for not enough good *
Internet: stephens@geod.emr.ca * mathematics *

268. Unix tracking program

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 17:42:29 UTC
From: j2yc@jupiter.sun.csd.unb.ca
Message-ID: <1994Feb18.174229.2315@jupiter.sun.csd.unb.ca>
Source record: 27922

Last year I found a satellite tracking program (w/ source) for unix.
It was menu driven and gave output in the form of a file which gave
azimuth and elevation reading for the times you have entered.

I made modifications to the program to allow it to be run completely
from the command line (such as in a batch environment) however
I have lost not only my modified program and the original program,
I've forgotten the name of the program... eeps

Derek
j2yc@jupiter.sun.csd.unb.ca
--
Derek J. Billingsley	"When the walls come tumbling
University of New Brunswick	in - though we may deserve
j2yc@jupiter.sun.csd.unb.ca	it, it will be worth it".
---

269. * SpaceNews 21-Feb-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 19:18:05 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0221.1994@ampr.org>
Source record: 27923
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

```
SB NEWS @ AMSAT $SPC0221
* SpaceNews 21-Feb-94 *

BID: $SPC0221

=========
SpaceNews
=========

MONDAY FEBRUARY 21, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* OSCAR SKN BEST FISTS *
========================
Many thanks to all who participated in our 22nd Annual Straight Key Night
on OSCAR, 1 January 1994. The following "Best Fist" nominations have been
received: W1NU, WQ3Y and W6HDO. Although we didn't ask that logs be
submitted, several participants also reported working AMSAT-NA's esteemed
president, W3XO/5, in one of Bill's rare appearances on CW (PVRC members
especially will appreciate the significance of this occasion). An
"honorary" Best Fist nomination goes to you, Bill; let's hope that more SSB
ops will follow your fine example, dust off their old pump handles, and
enjoy the fun.

See you all next year!

[Info via Ray, W2RS]

* STS-62 PRE-LAUNCH ORBITAL DAT
================================
STS-62
1 00062U 94062.63664409 .00073440 00000-0 22129-3 0 29
2 00062 39.0115 247.8629 0006644 298.2691 61.7477 15.90695888 27

Satellite: STS-62
Catalog number: 00062
Epoch time: 94062.63664409 = (03 MAR 94 15:16:46.05 UTC)
Element set: 002
Inclination: 39.0115 deg
RA of node: 247.8629 deg Space Shuttle Flight STS-62
Eccentricity: .0006644 Prelaunch Element set JSC-002
Arg of perigee: 298.2691 deg Launch: 03 MAR 94 13:54 UTC
Mean anomaly: 61.7477 deg
Mean motion: 15.90695888 rev/day G. L. Carman
```

Decay rate: 7.3440e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 310

[Info via Gil Carman]

* OSCAR-13 ZRO TEST SKED *
==========
The ZRO Memorial Technical Achievement Award Program, or just "ZRO Test" has a new schedule for February and March, 1994, via AMSAT-OSCAR-13. This activity is a test of operating skill and equipment performance.

During a typical ZRO run, a control station will send numeric code groups using CW at 10 words-per-minute. At the beginning of the run, uplink power from the control station is set to match the general beacon downlink strength. This is level "zero". The control operator will send and repeat a random five-digit number, then lower his uplink power by 3 dB (half power) and repeat the procedure with a new random number (level "1"). This will continue to a level 30 dB below the beacon (level "A").

A participating listener monitors the downlink signals till he can no longer copy the numbers. Those who can hear the beacon will qualify for the basic award by copying the code group heard at level "zero". The challenge is to improve home-station performance to a point where the lower-level downlink signals can be copied (levels 6 through A). To date, only one station (Darrel Emerson, AA7FV) has successfully copied level "A".

The following schedule of Mode "B" tests were chosen for convenient operating times and favorable squint angles. The tests can be heard on 145.840 MHz. Andy WA5ZIB will conduct all the tests. Mode "JL" tests will no longer occur due to the failure of AO-13's 70-cm transmitter.

Day Date (UTC) Time Areas covered

Sunday Feb. 20, 1994 0330 UTC NA, NW SA, Japan, Pacific
Saturday Feb. 26, 1994 1930 UTC NA, SA, Europe, Africa, ME
Saturday Mar. 19, 1994 1930 UTC NA, SA, Europe, Africa
Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC", thus the first test listed occurs at 9:30 PM CST
announced as soon as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy MacAllister WA5ZIB, AMSAT V.P. User Operations, 14714 Knights Way Drive, Houston, TX 77083-5640. A report will be returned verifying the level of accurate reception. An S.A.S.E. is appreciated but not required.

Information about the AMSAT Awards Program can be found on page 197 of the "Proceedings of the AMSAT-NA Tenth Space Symposium" (1992). This paper, covering all the AMSAT-NA awards including specifics on the ZRO Test, was reprinted on page 10 in the March/April 1993 issue of "The AMSAT Journal". The ZRO Test information provided in the article covers test procedures,

means for obtaining certificates and gives some historical background about the program. Reprints of the article can be obtained for an S.A.S.E. to WA5ZIB at the address above.

[Info via WA5ZIB]

* DISCOVERY-MIR RADIO LINK *
==========
The Space Shuttle Discovery's crew and the MIR Russian space station made an Amateur Radio contact on 08-Feb-94 during a period of time when Discovery was over the south Pacific and MIR was over the Caribbean.

"We fly during a lot of time with Sergej and I wish a good work with his North American collegues, and a not problems return to the Earth", said Valery Polyakov one of the MIR cosmonauts. "Thanks, I heard you perfect", replied Krikalev in Russian.

[Info via Gustavo, LW2DTZ of AMSAT-LU]

* AMSAT HF PBBS *
==========
WT0N-3 in St. Paul, MN, USA will be on 10.127 LSB (30 meters) Monday through Saturday from 1600 UTC until 23OO UTC. This station will carry all AMSAT bulletins and Keps. It will also carry other satellite related items such as "SpaceNews". This PBBS will be set up on 300 baud HF packet, but will also be available for AMT
to do so. At this time, the PBBS will be set up as an experiment and any comments and suggestions should be directed to the sysop, BJ Arts, WT0N, at any one of the following addresses:

PACKET: WT0N@WB0GDB.#STP.MN.USA.NOAM
INTERNET: BJARTS@STTHOMAS.EDU

[Info via WT0N]

* FO-20 SCHEDULE *
==========
The FO-20 command station announced that a slight malfunction in the onboard command system had been detected. As a result, analog mode operation arranged from 09-Feb-94 will be performed on schedule, but there is a possibility of interruption due to satellite ground station control.

The present schedule is as announced before:

Analog mode:
09-Feb-94 07:15 -to- 16-Feb-94 07:40 UTC
23-Feb-94 08:05 -to- 02-Mar-94 06:40 UTC
09-Mar-94 07:05 -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 -to- 30-Mar-94 08:15 UTC

Digital mode: Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
==========
Thanks to all those who sent QSL cards, letters, and messages of
appreciation regarding SpaceNews, especially:

N2WPW EA4RCT VK4STS G7MJL XX9AS KY0R

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

270. Re: Landsat Transmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 22:29:42 UTC
From: steve@NETSYS.COM
Message-ID: <steve.761610582@netsys.com>
Source record: 27924

boyer@rd.eng.bbc.co.uk (John Boyer) writes:

>I have seen the orbital elements for Landsat in this group. Does anyone
>know about the transmissions from this sat. Yes we have all seen the great
>pickies, but is it at all feasable for 'joe public' to receive and decode
>the info?

>Has anyone got frequecies and info on the modulation?

>John B

>John.boyer@rd.eng.bbc.co.uk

It's something like 85 megabits, which means Joe Public needs a pretty
hefty antenna -- maybe 10 m.

Steve Eigsti

271. EOSS Balloon Flight In Denver

Newsgroup: rec.radio.amateur.space
Date: 1994-02-18 22:37:50 UTC
From: rickvg@cscns.com
Message-ID: <-CKPjSEHGkfN057yn@cscns.com>
Source record: 27925
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.shortwave

For Followups to this post check the newsgroup rec.radio.amateur.space

Edge of Space Sciences, Inc. (EOSS) is a non-profit organization comprised of individuals interested in the use of high altitude balloon flights to offer an experimental platform for students and other experimenters. The group has a very high level of participation by amateur radio operators, however, this is NOT a requirement for membership and participation.

EOSS has flown 14 successful flights over the past few years. We regularly fly amateur television, and a suite of atmospheric sensors.

Other experimental payloads have included, GPS and LORAN-C for a comparison of their accuracy. Homebrew differential GPS on the same flight. Students of Coloraro University at Boulder (CU) created their own differential system using a gps receiver at a KNOWN location, and calculated the offsets themselves, allowing the GPS vs. LORAN-C comparison greater accuracy.

EOSS hosted last year's "National Balloon Symposium" in Denver Colorado. People from more than 10 states, and Canada were in attendance as well as some of the commercial providers of equipment used in our "hobby".

We plan to fly EOSS-15 soon and here is our general information release about this flight. If you have any questions about the flight or EOSS please use email to my address (sig file at bottom).

EOSS-15 FLIGHT PROFILE

LAUNCH SITE:
Thunder Ridge Middle School
Picadilly and Smokey Hill Rd.
Aurora, Colorado, USA

latitude 39.61195 deg North
longitude 104.75050 deg West

(The lat/lon is actually for a location within 1 mile of launch point. I haven't been to the launch site to take an accruate fix yet.)

LAUNCH DATE: February 26,1994

LAUNCH TIME: 1600 UTC (Set up 1400 UTC) Launch time subject to FAA approval

ON-BOARD EXPERIMENT: Conducted by Cherry Creek High School.

PURPOSE: To measure the various levels of alpha, beta, and gamma radiation at various altitudes.

SHUTTLE FREQUENCIES:
Packet: 144.340
ATV: 426.250
CW Beacon: 147.555
Carries the call of WB4ETT

There will be a HF net run by Sparky\ KA0DPC on 7.232 MHz (phone). And the FOXHUNTER'S will coordinate on the Colorado Repeater Association's repeater 147.225 MHz (+600kHz). This will also be used for some local information during the flight. Thanks in advance to the Colorado Repeater Association for the use of their repeater.

REMARKS: Edge of Space Sciences will provide the platform for Cherry Creek High School and Thunder Ridge Middle School to study the lower atmosphere. Cherry Creek H.S. students have modified a geiger counter to meet the EOSS interface specifications which will measure the alpha, beta, and gamma levels of radiation vs. altitude. The experiment will gather data that should interest local NASA and NOAA officials.

Thunder Ridge M.S. students will make graphs that will help them understand the temperature vs. altitude and balloon dynamics by graphing the ascent and descent rate of the balloon.

The project will be presented at this years Denver, News 4 Education Exposition at the Colorado Convention Center on March 11,12,13 1994. More information about the EXPO can be obtained from EOSS.

Sponsorship for this flight and Education Exposition have been provided by:

Olde Antenna Lab
Dave Clingerman (W6OAL)
4725 W. Quincy
Num 1014
Denver, CO 80236
303-798-5926
303-498-3820

for his:
70 cm ATV Candelabra Antenna
GPS Wheel Antenna
Financial support in Sponsoring EOSS at the KCNC Expo

AT&T
for their:
Financial support in Sponsoring EOSS at the KCNC Expo

SUBMITTED on packet BY: Brian Thomas\N0VSA ground station co-lead
N0VSA@W0GVT.#NECO.CO.USA.NOAM

relayed to internet by:

Rick von Glahn
rickvg@cscns.com -- Internet (preferred)
74620,637 -- Compuserve
N0KKZ@W0GVT.#NECO.CO.USA -- packet radio

272. Daily IPS Report - 19 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-19 00:27:32 UTC
From: dave@eram.esi.com.au
Message-ID: <5199@eram.esi.com.au>
Source record: 27926
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 18 February 1994
Summary for 18 February and Forecast up to 21 February
IPS Warning 06 was issued on 17 Feb and is current for
20-23 Feb.

1A. SOLAR SUMMARY
Activity: low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 106/055

1B. SOLAR FORECAST
19 February 20 February 21 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : quiet

Estimated Indices : A K Observed A Index 17 February
Learmonth 03 2012 1002
Fredericksburg 07 11
Planetary 07 08

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
19 Feb 10 Quiet to unsettled.
20 Feb 18 Unsettled to active.
21 Feb 20 Active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
18 Feb normal normal normal

PCA Event : None.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
19 Feb normal normal fair
20 Feb normal fair poor
21 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were about 10% above predicted monthly values

T index: 51

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
19 Feb 55 About 10% above predicted monthly values.
20 Feb 20 About 10% below predicted monthly values.
21 Feb 10 About 15% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

273. Re: It's Official: GPS Anti-spoofing Is Now on Continuously

Newsgroup: rec.radio.amateur.space
Date: 1994-02-19 12:41:36 UTC
From: "Richard B. Langley" <lang@unb.ca>
Message-ID: <1994Feb19.124136.18599@jupiter.sun.csd.unb.ca>
Source record: 27927
Cross-posted to: rec.boats,rec.radio.amateur.space,comp.infosystems.gis,rec.aviation.misc

In article <petere-170294132157@engels.mitre.org> petere@mitre.org (Peter D. Engels) writes:

>to civilian users. However, DO NOT PANIC. All the GPS receivers on the
>market, and in the marine stores today, do not use the P-Code. Tey rely
>entirely on the C/A code. This announcement has no practical meaning for
>us civilian GPS users.

Not quite true! It may be true for civilian navigators but it's not true for civilian geodisists and scientists who need access to L2 to correct for the effects of the ionosphere. The C/A-code is not transmitted on L2 -- only the P-code which is now encrypted. This means that clever ways had to be found to get access to L2 all of which result in a lower signal-to-noise ratio (i.e. more noise) on the measurements with the attendant lower accuracy of position measurements.

-- Richard Langley
Professor
==
Richard B. Langley Internet: LANG@UNB.CA or SE@UNB.CA
Geodetic Research Laboratory BITnet: LANG@UNB or SE@UNB
Dept. of Geodesy and Geomatics Engineering Phone: (506) 453-5142
University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
==

274. ARnet - Ham Radio Network

Newsgroup: rec.radio.amateur.space
Date: 1994-02-19 22:24:00 UTC
From: john.woodstock@woodybbs.com
Message-ID: <93.23.4526.0NFB24AA@woodybbs.com>
Source record: 27928

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Amateur Radio Net

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Amateur Radio Net is a net dedicated to Amateur Radio enthusiasts. If
you are an Amateur Radio enthusiast, or any of your callers are, this is
an echomail network for you. ARnet is replacing an older ham radio
network that recently folded - RF-Net(tm).

If you would like to get more information about this net, please look
for the information packet ARNET024.ZIP on the following BBS's:

Channel1
SaltAir
Mustang HQ BBS
Execnet
Intelec
Sound Of Music
and the Network Host BBS - The Silicon Garden.
It can be FREQ'd from 1:2619/211 using a magic name of ARNET

ARnet is available via QWK & FIDO. As this is the initial announcement
of the net many HUB positions are still open.

If you have any questions, please contact me.

John Woodstock, N2HAA
P.O. Box 436
Coram, NY 11784
BBS: 516-736-6662
FIDO: 1:2619/211
Internet: SysOp@woodybbs.com

---
```

TXTBCST 1.3b: ARnet - Ham Radio Info Source

275. Stanford OSCAR talk in Berkeley, CA, USA.

Newsgroup: rec.radio.amateur.space
Date: 1994-02-19 22:39:02 UTC
From: marchant@sdp1.cea.berkeley.edu
Message-ID: <2k64e6$jo4@agate.berkeley.edu>
Source record: 27929

On Thursday, March 3rd, at 7:30 PM, Professor Robert Twiggs of Stanford's newly formed small satellite department will be giving a talk about their amateur radio based satellite program. Professor Twiggs's extensive background in amateur satellites at Weber State University included OSCAR WO-18 and NUSAT I. His positive experience with including OSCAR activities in the education curriculum has led him to establish a program at Stanford. He hopes to get faculty, staff, students and local volunteer engineers to work together in a similar manner as was done at WSU to design, build, launch and operate microsatellites at Stanford. Professor Twiggs will be discussing possible payloads for Stanford's amateur satellites and science payloads for the larger buses that they would like to build.

The talk will be held in downtown Berkeley, CA at UCB's Center for EUV Astrophysics, 2150 Kittredge Street. The CEA is between Shattuck and Oxford Streets, diagonally across from the California Cinema.

A tour of the CEA, including the Science Operations Center for NASA's Extreme Ultraviolet Explorer satellite (EUVE), will be available for those arriving at 7:00 PM.
--

Will Marchant Center for Extreme Ultraviolet Astrophysics
marchant@cea.berkeley.edu University of California
KC6ROL@N0ARY 2150 Kittredge St., Berkeley, CA 94720 USA

276. Two-Line Orbital Element Sets (TLE345)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-20 16:36:23 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.761762183@afit.af.mil>
Source record: 27930
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #345 -
Alouette 1
1 00424U 62049 94045.45827772 .00000075 00000-0 77418-4 0 9662
2 00424 80.4610 46.0904 0024601 70.8475 289.5329 13.67797961565626
ATS 3
1 03029U 67111A 94043.32884620 -.00000118 00000-0 10000-3 0 1642
2 03029 14.5668 8.8081 0011454 266.6574 239.6985 1.00272226 96180
Cosmos 398
1 04966U 71016A 94046.15405409 .00139859 66605-5 31802-3 0 149
2 04966 51.4544 79.8521 1153561 9.2683 352.7700 13.58225056755965
Starlette
1 07646U 75010A 94045.09418492 -.00000105 00000-0 28546-4 0 7595
2 07646 49.8290 279.1007 0206127 289.6451 68.2305 13.82185755960820
LAGEOS
1 08820U 76039A 94045.65107050 .00000012 00000-0 10000-3 0 9660
2 08820 109.8416 93.6376 0044387 311.4872 48.2109 6.38664329159326
ETS-2
1 09852U 77014A 94044.81965196 -.00000343 00000-0 10000-3 0 9499
2 09852 11.9332 43.0048 0000834 353.5814 154.4927 1.00006089 9429
GOES 2
1 10061U 77048A 94046.35282439 .00000075 00000-0 10000-3 0 2879
2 10061 10.9723 47.1937 0001467 355.0586 94.1934 1.00262287 5893
IUE
1 10637U 78012A 94045.07887356 -.00000270 00000-0 10000-3 0 9726
2 10637 34.4140 96.8842 1305166 32.2055 348.4868 1.00243922 11490
GPS BI-01
1 10684U 78020A 94036.46343223 .00000004 00000-0 10000-3 0 2503
2 10684 64.5592 49.4293 0063599 163.7934 196.4886 1.98069621102320
GPS BI-02
1 10893U 78047A 94031.36756412 -.00000010 00000-0 10000-3 0 434
```

```
2 10893 63.5978 288.8006 0212017 13.8231 346.8319 2.01627528115312
GOES 3
1 10953U 78062A 94042.48012569 .00000057 00000-0 10000-3 0 2758
2 10953 9.8873 49.7690 0004601 118.8724 330.0679 1.00275815 10460
SeaSat 1
1 10967U 78064A 94046.23754017 .00000046 00000-0 59855-4 0 2663
2 10967 108.0019 209.8284 0001772 238.6298 121.4669 14.37923306818837
GPS BI-03
1 11054U 78093A 94041.63598018 -.00000004 00000-0 10000-3 0 1593
2 11054 63.2990 285.4847 0043212 176.1309 183.9671 1.93505120112060
Nimbus 7
1 11080U 78098A 94045.17243193 -.00000001 00000-0 37021-4 0 3661
2 11080 99.0727 293.2811 0009628 100.9261 259.2975 13.83730214773060
GPS BI-04
1 11141U 78112A 94040.31185017 -.00000004 00000-0 00000+0 0 8623
2 11141 64.5663 50.3425 0047704 26.0007 334.2798 1.92894722 1311
GPS BI-05
1 11690U 80011A 94041.26363559 -.00000009 00000-0 10000-3 0 7592
2 11690 64.8829 51.1329 0143140 186.7505 172.8232 2.00554404116997
GPS BI-06
1 11783U 80032A 94043.64590162 -.00000010 00000-0 10000-3 0 9543
2 11783 62.7218 282.4039 0209115 29.1795 332.0683 2.03456835101426
GOES 5
1 12472U 81049A 94032.49890686 .00000100 00000-0 10000-3 0 7472
2 12472 6.5371 59.6666 0004150 355.6865 113.8766 1.00267335 4403
Cosmos 1383
1 13301U 82066A 94044.50186910 .00000065 00000-0 59030-4 0 2648
2 13301 82.9269 40.4399 0029128 74.9561 285.4811 13.68051515580512
LandSat 4
1 13367U 82072A 94045.14458002 .00000199 00000-0 54183-4 0 4444
2 13367 98.1978 105.8035 0006158 280.7655 79.2850 14.57120828616146
IRAS
1 13777U 83004A 94044.06218925 -.00000121 00000-0 -53353-4 0 5696
2 13777 98.9728 237.5690 0013127 302.6041 57.3852 13.99197597233785
Cosmos 1447
1 13916U 83021A 94045.15461643 .00000015 00000-0 11915-7 0 3653
2 13916 82.9458 102.7072 0039051 14.0514 346.1719 13.74304741546437
TDRS 1
1 13969U 83026B 94041.00190701 -.00000053 00000-0 10000-4 0 2765
2 13969 7.4754 53.2288 0029305 134.6733 32.0581 0.99797156 12770
GOES 6
1 14050U 83041A 94041.10798961 -.00000197 00000-0 10000-3 0 1696
2 14050 5.3553 62.5030 0007883 125.0964 261.5218 1.00224827 11511
OSCAR 10
1 14129U 83058B 94041.03785160 -.00000138 00000-0 10000-3 0 2618
2 14129 27.2065 342.3641 6022608 153.3557 257.8051 2.05878353 52193
LandSat 5
1 14780U 84021A 94044.77076695 .00000145 00000-0 42133-4 0 306
2 14780 98.1796 106.8949 0003888 293.5025 66.5760 14.57127125529508
UoSat 2
```

```
1 14781U 84021B 94044.54889300 .00000363 00000-0 69607-4 0 6647
2 14781 97.7907 65.0254 0011279 310.7761 49.2455 14.69144313532150
GPS BI-09
1 15039U 84059A 94045.57773211 -.00000028 00000-0 10000-3 0 1705
2 15039 63.8985 44.8827 0057638 219.0139 140.5857 2.00559735 70885
Cosmos 1574
1 15055U 84062A 94044.82267329 .00000031 00000-0 16446-4 0 5643
2 15055 82.9588 156.0231 0026513 197.6367 162.3870 13.73599598483698
GPS BI-10
1 15271U 84097A 94044.00636708 -.00000012 00000-0 10000-3 0 7698
2 15271 62.4299 282.3631 0143824 347.7929 11.9368 2.00577697 67967
Cosmos 1602
1 15331U 84105A 94046.36168587 .00000747 00000-0 86078-4 0 2611
2 15331 82.5334 191.7751 0018602 245.9090 114.0182 14.84288609506443
NOAA 9
1 15427U 84123A 94042.04099432 .00000079 00000-0 66430-4 0 7118
2 15427 99.0695 90.9496 0014405 213.7271 146.2987 14.13587457472525
GPS BI-11
1 16129U 85093A 94046.24175762 -.00000020 00000-0 10000-3 0 5668
2 16129 64.6444 46.9603 0130936 141.3396 219.6269 2.00563692 7719
Mir
1 16609U 86017A 94046.22601279 .00010013 00000-0 12651-3 0 1351
2 16609 51.6167 78.1749 0003930 337.0200 23.0616 15.60222720457029
SPOT 1
1 16613U 86019A 94044.83607874 .00000089 00000-0 62356-4 0 6355
2 16613 98.7020 120.6130 0000601 83.3690 276.7555 14.20046828 99059
Cosmos 1766
1 16881U 86055A 94045.99913698 .00000673 00000-0 79140-4 0 1627
2 16881 82.5175 250.1810 0017882 273.1928 86.7243 14.83324202407346
EGP
1 16908U 86061A 94045.59933741 -.00000097 00000-0 00000+0 0 8667
2 16908 50.0069 101.2805 0011343 1.9976 358.0902 12.44408937 10120
NOAA 10
1 16969U 86073A 94042.03977394 .00000090 00000-0 56695-4 0 6098
2 16969 98.5108 54.8792 0013388 342.7675 17.3049 14.24863864384641
MOS-1
1 17527U 87018A 94045.18451185 .00000090 00000-0 99794-4 0 296
2 17527 99.0476 116.3901 0000294 160.2366 199.8807 13.94895073355799
GOES 7
1 17561U 87022A 94044.15744824 -.00000054 00000-0 10000-3 0 7380
2 17561 1.2864 77.3121 0004182 71.7116 298.3749 1.00275305 8735
Kvant-1
1 17845U 87030A 94046.09787415 .00012216 00000-0 15291-3 0 7583
2 17845 51.6165 78.8243 0004157 336.7454 23.1312 15.60225196457074
DMSP B5D2-3
1 18123U 87053A 94041.96455474 .00000048 00000-0 46851-4 0 3028
2 18123 98.7887 235.5076 0013976 176.7646 183.3620 14.15334661343158
RS-10/11
1 18129U 87054A 94046.01945799 .00000065 00000-0 54488-4 0 8625
2 18129 82.9203 59.1441 0012353 11.1494 348.9935 13.72331768333152
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Meteor 2-16
1 18312U 87068A 94044.75292468 .00000070 00000-0 49063-4 0 2624
2 18312 82.5568 309.7588 0013658 94.5698 265.7014 13.84022219327981
Meteor 2-17
1 18820U 88005A 94046.33979358 .00000030 00000-0 12997-4 0 2628
2 18820 82.5401 5.5070 0016642 157.5160 202.6730 13.84706663305497
DMSP B5D2-4
1 18822U 88006A 94040.85927695 .00000100 00000-0 62998-4 0 4030
2 18822 98.4581 260.9803 0006903 5.7012 354.4242 14.22926371312411
Glonass 34
1 19163U 88043A 94045.94333056 .00000002 00000-0 10000-3 0 8689
2 19163 65.0039 114.5527 0007470 166.1633 193.9421 2.13102164 44056
Glonass 36
1 19165U 88043C 94042.24498804 .00000013 00000-0 10000-3 0 2589
2 19165 64.9812 114.6471 0003813 327.6462 32.3981 2.13102242 44598
METEOSAT 3
1 19215U 88051A 94044.09751863 -.00000265 00000-0 10000-3 0 8694
2 19215 1.4574 73.0650 0002759 266.4287 124.5781 1.00269803 8678
AO-13
1 19216U 88051B 94045.70775246 -.00000445 00000-0 10000-4 0 8786
2 19216 57.8881 268.1308 7208859 334.9243 3.0158 2.09726368 11948
OKEAN 1
1 19274U 88056A 94044.86110950 .00000582 00000-0 69963-4 0 8622
2 19274 82.5136 351.0302 0021921 57.3277 303.0028 14.82086733302812
Meteor 3-2
1 19336U 88064A 94044.10041569 .00000051 00000-0 10000-3 0 2639
2 19336 82.5367 51.4903 0015909 209.5540 150.4679 13.16964952266929
Glonass 39
1 19503U 88085C 94042.27005430 -.00000081 00000-0 10000-3 0 1588
2 19503 65.7433 353.5646 0005371 174.0820 185.8989 2.13101849 42089
NOAA 11
1 19531U 88089A 94041.95529913 .00000086 00000-0 71175-4 0 5156
2 19531 99.1605 27.8414 0012274 124.5667 235.6663 14.12957646277398
TDRS 2
1 19548U 88091B 94043.59768740 -.00000294 00000-0 10000-3 0 8774
2 19548 0.7359 78.6408 0001138 212.7337 4.2522 1.00264061 6959
Glonass 40
1 19749U 89001A 94039.49431379 -.00000008 00000-0 10000-3 0 3710
2 19749 64.9474 114.3471 0005833 267.0998 92.9060 2.13100955 39539
Glonass 41
1 19750U 89001B 94046.12068989 .00000001 00000-0 10000-3 0 2589
2 19750 64.9615 114.1630 0007725 248.6326 111.4030 2.13101918 39696
GPS BII-01
1 19802U 89013A 94045.07764018 .00000001 00000-0 10000-3 0 8686
2 19802 55.0842 144.5896 0034628 176.8809 183.1594 2.00573825 36580
Akebono
1 19822U 89016A 94043.74222819 .00012604 00000-0 65477-3 0 2135
2 19822 75.0748 252.6352 3834741 21.9224 350.8960 7.75741287 99625
Meteor 2-18
1 19851U 89018A 94044.55769401 .00000107 00000-0 82803-4 0 2624
```

```
2 19851 82.5198 242.4732 0011047 225.2162 134.8075 13.84359023250582
MOP-1
1 19876U 89020B 94044.40289196 -.00000021 00000-0 10000-3 0 7727
2 19876 0.2039 40.1197 0002463 323.6678 283.5292 1.00273017 5837
TDRS 3
1 19883U 89021B 94041.14477350 -.00000282 00000-0 00000+0 0 8797
2 19883 0.0447 277.2371 0004928 291.1159 302.7400 1.00269482 88190
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2 20103 82.9566 19.3507 0036163 276.9484 82.7551 13.73832493231252
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Meteor 3-6
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1994003D
1 22972U 94003D 94025.38316413 .00186325 00000-0 47579+0 0 28
2 22972 82.5660 157.0055 0014254 255.9324 104.1467 13.16807686 54
DSPSE
1 22973U 94004A 94034.53938549 .00306989 69601-5 12994+0 0 230
2 22973 66.8036 61.5120 9071498 202.2030 45.6648 0.46368841 1370
1994004B
1 22974U 94004B 94043.85646869 .06325438 62091-5 69063-3 0 456
2 22974 67.0243 28.5987 0011704 153.5250 206.6595 16.36742126 2925
ProgressM21
1 22975U 94005A 94046.09787415 .00012216 00000-0 15291-3 0 339
2 22975 51.6165 78.8243 0004157 336.7454 23.1312 15.60225196 2823
OREX
1 22978U 94007A 94034.91970139 .00000150 00000-0 00000+0 0 16
2 22978 30.5073 159.4204 0007002 226.1375 134.0418 15.37491022 03
VEP
1 22979U 94007B 94045.93618564 -.00000106 00000-0 26569-3 0 94
2 22979 28.5813 156.7648 7221007 167.4111 231.8886 2.24302892 250
Raduga 31
1 22981U 94008A 94046.12125521 .00000121 00000-0 00000+0 0 168
2 22981 1.4959 274.9792 0006865 257.9532 63.6731 1.00230114 109
1994008D
1 22984U 94008D 94042.07581536 -.00000018 00000-0 10000-3 0 41
2 22984 1.5019 274.8586 0107462 307.3510 354.9674 0.98445037 55
1994008E
1 22985U 94008E 94043.60381613 .00001516 00000-0 98923-3 0 83
2 22985 47.4001 273.9974 7306139 1.8804 359.9741 2.22688341 177
1994008F
1 22986U 94008F 94045.86394458 .00000273 00000-0 48830-3 0 75
2 22986 47.4412 273.4208 7289337 2.4019 359.8876 2.22324116 203
1994004C
1 22987U 94004C 94030.19848196 -.00000610 00000-0 00000+0 0 18
2 22987 66.8677 61.5912 9062991 202.4263 45.7189 0.46073591 08
1994006B
1 22990U 94006B 94046.00310034 .00045403 00000-0 29892-3 0 29
2 22990 56.9892 164.3358 0017786 282.3663 77.5423 15.75088883 834
1994006C
1 22991U 94006C 94045.62371823 .00045719 00000-0 30796-3 0 25
2 22991 56.9887 166.0601 0015576 282.3605 77.5874 15.74611940 778
1994006F
1 22994U 94006F 94045.81666097 .00033209 00000-0 23371-3 0 21
2 22994 56.9890 165.2163 0013087 286.9848 72.9788 15.73792466 802
```

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1994006G
1 22995U 94006G 94047.27798830 .00029213 00000-0 20637-3 0 49
2 22995 56.9862 158.6377 0013012 291.9235 68.0446 15.73773191 1036
1994010A
1 22996U 94010A 94047.10212723 .00002559 49130-6 19464-3 0 19
2 22996 28.7025 253.4028 7324796 184.4178 160.2745 2.25711398 02
1994010B
1 22997U 94010B 94047.10463234 .00001781 00000-0 19464-3 0 18
2 22997 27.8784 253.4504 7318240 184.1947 163.6964 2.25765039 03
1994006H
1 22998U 94006H 94046.70642961 .00000828 00000-0 10000-4 0 69
2 22998 56.9863 161.2111 0012753 297.8544 62.6659 15.73670071 561
1994011A
1 22999U 94011A 94045.89424602 .00000160 00000-0 85171-3 0 75
2 22999 82.5782 300.9984 0008649 274.6235 85.3863 12.61000049 325
1994011B
1 23000U 94011B 94045.17912318 .00000012 00000-0 10000-4 0 50
2 23000 82.5683 301.4444 0006887 306.2545 53.8019 12.61754251 238
1994011C
1 23001U 94011C 94046.20798060 .00007412 00000-0 41159-1 0 93
2 23001 82.5789 300.7888 0008320 344.3230 15.7595 12.62663385 366
1994011D
1 23002U 94011D 94044.54543615 .00000029 00000-0 10000-3 0 48
2 23002 82.5712 301.8432 0009842 10.2453 358.9401 12.63249251 143
1994011E
1 23003U 94011E 94044.54543615 .00000029 00000-0 10000-3 0 38
2 23003 82.5732 301.8456 0014230 17.0164 355.8340 12.64137698 143
1994011G
1 23005U 94011G 94045.42754122 .00000215 00000-0 12574-2 0 40
2 23005 82.5791 301.3075 0040429 241.0613 118.6417 12.55114030 256
1994010C
1 23009U 94010C 94048.42258409 .00000176 84269-6 18426-4 0 15
2 23009 29.1125 252.3071 7333331 185.6350 158.4834 2.26247956 36
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

277. ANS-050 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-20 19:06:57 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-050.01.1994@ampr.org>
Source record: 27931
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT
NEW HF BBS FOR OSCAR INFO

HR AMSAT NEWS SERVICE BULLETIN 050.01 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-050.01

New HF Packet Radio BBS Carrying AMSAT Info

WT0N-3 St. Paul, Minnesota will carry all AMSAT bulletins and Keps as well as other satellite related items such as "SPACENEWS." The station will be on 10.127 LSB (30M) Monday through Saturday from 16:00 UTC until 23:OO UTC Monday through Saturday. The PBBS uses 300 baud HF Packet, but will also be available for AMT
is 23:30 to 04:00 UTC. At this time, the PBBS is set up as an experiment and any comments and suggestions should be sent to the SYSOP, B.J. Arts (WT0N), at one of the following:

PACKET:WT0N@WB0GDB.#STP.MN.USA.NOAM
INT

[The AMSAT News Service (ANS) would like to thank B.J. Arts (WT0N) for this information.]

/EX
SB SAT
AO-13 OPERATIONS NET

HR AMSAT NEWS SERVICE BULLETIN 050.01 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-050.02

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

28-Feb-94 0430 B 068 WB6LLO W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

/EX
SB SAT
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 050.03 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-050.03

Weekly OSCAR Status Reports: 19-FEB-94

AO-13: Current Transponder Operating Schedule:
L QST
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The FO-20 command station announced that a slight mulfunctioning in the onboard command system had been detected. So, the analog mode operations arranged from 9th of Feb. will be performed on schedule, but there is a possibility of interruption due to commading. The present schedule is as same announced before.
ANALOG MODE:
23-FEB-94 8:05 -TO- 02-MAR-94 6:40 UTC
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-16: Operating normally. Experimenter's Day with S-Band transmitter on will be run on 02/23/94 03:45 UTC to 02/24/94 03:15 UTC. Whole Orbit Data (WOD) collections each month by week are: 1) Solar Array Currents, 2) Temperatures 3) Power/Bus Voltages 4) Various telemetry parameters to be determined by the Command Team.
[WH6I & WJ9F]

LO-19: Operating normally. [WH6I]

KO-23: Up and running. [WH6I]

KO-25: BBS up and running. [WH6I]

POSAT: Definitely seems to be turned off on the amateur frequencies.
[WH6I]

IO-26: Is back up and running (1200 baud) and seeing a lot of use. [WH6I]

AO-21: LW2DTZ reports that the RUDAK-II beacon was sending the following
information: RUDAK2>BEACON:RUDAK-II Schedule: (down 145.987 MHz,
up 435.016) min/10 Beacon Mode
0..4 FM Repeater
5..7 WEFAX Picture
8..9 AFSK TLM

LW2DTZ further notes that AO-21 is very active with hams from south
of Brazil using this crossband repeater. [LW2DTZ]

MIR: MIR is working normally in 145.550 MHz. R0MIR and R0MIR-1 Personal
Messaging System (PMS) are active on all the orbits. [LW2DTZ]

RS-10: ZS6AOP reports that RS-10 is still operating normally at his QTH.
He notes that there are a handful of regular stations keeping
the contacts going but recently he has experienced a quiet spell,
only hearing himself. ZS6AOP wonders what the preferred mode of
operation is over Europe and the USA? Do any stations use CW? The
only times has heard CW over Southern Africa is for tuning and
spotting one's own signal. [ZS6AOP]

UO-11: ZS6AOP has been monitoring this satellite at regular intervals.
It is his observation that the signals are weaker today than before
the on-board computer "crash" several months ago. [ZS6AOP]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current
set of orbital elements are not generating the correct AOS/LOS times at
your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you
provide will be of value to all OSCAR enthusiasts.

/EX

278. Daily IPS Report - 20 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-21 06:19:21 UTC
From: dave@eram.esi.com.au
Message-ID: <5200@eram.esi.com.au>
Source record: 27932
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 19 February 1994
Summary for 19 February and Forecast up to 22 February
IPS Warning 06 was issued on 17 Feb and is still current.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 108/058

1B. SOLAR FORECAST
20 February 21 February 22 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : unsettled

Estimated Indices : A K Observed A Index 18 February
Learmonth 12 2232 3243
Fredericksburg 16 07
Planetary 18 07

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
20 Feb 16 Unsettled to active.
21 Feb 18 Unsettled to active.
22 Feb 16 Unsettled to active.

2C. MAGNETIC COMMENT
None.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
19 Feb normal normal fair-normal
PCA Event : None.

3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
20 Feb normal fair poor
21 Feb normal fair poor
22 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
NONE.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 15 to 30% above predicted monthly values

T index: 81

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
20 Feb 20 About 10% below predicted monthly values.
21 Feb 30 Near predicted monthly values.
22 Feb 35 Near predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
None.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

279. Daily IPS Report - 21 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-21 06:19:59 UTC
From: dave@eram.esi.com.au
Message-ID: <5201@eram.esi.com.au>
Source record: 27933
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 20 February 1994
Summary for 20 February and Forecast up to 23 February
IPS Warning 06 was issued on 17 Feb and is current for
interval 20-23 Feb.

1A. SOLAR SUMMARY
Activity: moderate

Flares Max Fadeout Begin End Freq. Sectors
M4/3B 0141UT Confirmed 0116UT - Lower West Pacific

Observed 10.7 cm flux/Equivalent Sunspot Number : 108/058

1B. SOLAR FORECAST
21 February 22 February 23 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 110/060

1C. SOLAR COMMENT
A proton event began at 20/0300UT in association with the M4 flare.
A large solar filament located near this region has
dissappeared. Flaring region has simplified and is not expected to
produce further flares.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : mainly quiet to unsettled.

Estimated Indices : A K Observed A Index 19 February
Learmonth 12 4232 2331
Fredericksburg 16 23
Planetary 16 17

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
21 Feb 20 Active.
22 Feb 30 Active to minor storm.
23 Feb 30 Active to minor storm.

2C. MAGNETIC COMMENT
A shock is expected in the field from the M4 flare at approx.

21/2000 UT. Further activity is expected from filament dissappearance
on the 23rd. Recurrent activity (coronal hole) also expected
Feb 22-24. Minor storm periods are expected during local night.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH
20 Feb normal normal poor-normal
PCA Event : Began at 0300UT, peaked at 0915UT (74PFU), in progress.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
21 Feb normal fair poor
22 Feb fair poor poor
23 Feb fair poor poor
3C. GLOBAL HF PROPAGATION COMMENT
High lat comms effected by proton event after 0300 UT on 20th. Event
declining. Further poor conditions expected for high lats over next
four days.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were near predicted monthly values until this morning
when enhancements of up to 20% were observed.

T index: 51

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
21 Feb 60 Near predicted monthly values.
22 Feb 30 10 to 20% below predicted monthly values.
23 Feb 30 10 to 20% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded and depressed HF conditions are expected over the next
four days due to recurrent/flare and dissappearing filament
activity.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

280. APT-Satellites: Report FEB 19, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-02-21 08:29:10 UTC
From: peter.henne@gmd.de
Message-ID: <1994Feb21.082910.10193@gmd.de>
Source record: 27934
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, FEB 19, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On (weak)

NOAA-9 performs well after the outgassing-period, transmitting
Ch.2 and Ch.4 during spacecraft-day and Ch.3 and Ch.4 during
spacecraft-night. The morning descending orbits pass over better
illuminated areas than afternoond-ascening NOAA-11. APT and BCN
of NOAA-9 will be switched off FEB 21 due to VHF-conflict with
NOAA-11 (info from wxsat-list).
Meteor 2-21 is more or less useless for normal APT-Stations.
Meteor 3-3, -4, -5 and -6 were off during all visible passes,
a message about active Meteor 3-6 APT could not be confirmed.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
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281. ARLK007 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-02-21 16:23:43 UTC
From: w1aw-list-approval@world.std.com
Message-ID: <$arlk007.1994@ampr.org>
Source record: 27935
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK007
ARLK007 Keplerian data

ZCZC SK74
QST de W1AW
Keplerian Bulletin 7 ARLK007
From ARRL Headquarters
Newington, CT February 19, 1994
To all radio amateurs

SB KEP ARL ARLK007
ARLK007 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94041.03785160 -.00000138 10000-3 0 2617
2 14129 27.2065 342.3641 6022608 153.3557 257.8051 2.05878353 52193
RS-10/11
1 18129U 87054 A 94048.06093502 0.00000012 13875-4 0 8646
2 18129 082.9197 057.6327 0011716 002.6869 357.4911 13.72331189333430
UO-11
1 14781U 84021 B 94044.54889300 0.00000363 69607-4 0 6646
2 14781 97.7907 65.0254 0011279 310.7761 49.2455 14.69144313532150
RS-12/13
1 21089U 91007 A 94044.66379265 0.00000043 29527-4 0 6624
2 21089 82.9220 103.0678 0030946 91.8517 268.6203 13.74034946151682
AO-13
1 19216U 88051 B 94046.66135778 0.00002242 12555-0 0 8791
2 19216 057.8129 267.9831 7205073 334.9717 002.9154 02.09729204011960
UO-14
1 20437U 90005 B 94046.18347456 0.00000060 40471-4 0 9648
2 20437 98.5953 132.5942 0010599 186.2827 173.8225 14.29823413212157
AO-16
1 20439U 90005 D 94045.75388848 0.00000076 46533-4 0 7642
2 20439 98.6038 133.2765 0010934 188.0238 172.0765 14.29879034212109
DO-17
1 20440U 90005 E 94045.23034447 0.00000070 44132-4 0 7636
2 20440 98.6058 133.0443 0010965 189.4352 170.6623 14.30017107212047
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WO-18
1 20441U 90005 F 94045.76328214 0.00000059 39826-4 0 7656
2 20441 98.6054 133.5798 0011505 188.3662 171.7330 14.29993172212124
LO-19
1 20442U 90005 G 94045.74960276 0.00000064 41740-4 0 7637
2 20442 98.6048 133.7927 0011921 187.6862 172.4137 14.30087334212130
FO-20
1 20480U 90013 C 94046.42832899 -.00000014 49346-4 0 6593
2 20480 99.0216 221.3367 0539917 255.4010 98.6634 12.83223845188515
AO-21
1 21087U 91006 A 94047.99815709 0.00000002 30666-5 0 4268
2 21087 082.9394 231.6402 0036189 059.3554 301.1680 13.74533028153072
UO-22
1 21575U 91050 B 94046.13690949 0.00000113 52716-4 0 4656
2 21575 98.4466 123.0432 0007219 301.1937 58.8542 14.36890610135556
KO-23
1 22077U 92052 B 94046.40390865 -.00000037 10000-3 0 3600
2 22077 66.0810 174.9628 0009874 317.5713 42.4539 12.86284764 71129
KO-25
1 22830U 93061H 94045.75293537 0.00000053 38624-4 0 2646
2 22830 98.5674 121.3071 0011406 172.0390 188.0975 14.28033386 20227
IO-26
1 22826U 93061 D 94042.21058899 0.00000053 39268-4 0 2611
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
AO-27
1 22825U 93061 C 94046.21545311 0.00000058 41460-4 0 2616
2 22825 98.6626 123.1936 0008062 202.2052 157.8775 14.27607193 20284
PoSat
1 22829U 93061 G 94045.75585944 0.00000072 46760-4 0 2540
2 22829 98.6608 122.7699 0009759 191.0097 169.0872 14.28003980 20229
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000 0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
Mir
1 16609U 86017 A 94048.08346927 0.00010503 12582-3 0 1405
2 16609 051.6194 068.8223 0005218 334.0639 026.0757 15.60261716457315

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
February 22, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
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282. Daily IPS Report - 22 Feb 94

Newsgroup: rec.radio.amateur.space
Date: 1994-02-22 02:47:30 UTC
From: dave@eram.esi.com.au
Message-ID: <5204@eram.esi.com.au>
Source record: 27936
Cross-posted to: aus.radio,rec.radio.amateur.space,rec.radio.info

IPS RADIO AND SPACE SERVICES AUSTRALIA
Daily Solar And Geophysical Report
Issued at 2330 UT 21 February 1994
Summary for 21 February and Forecast up to 24 February
IPS Warning 06 was issued on 17 Feb and is current for
interval 20-23 Feb.

1A. SOLAR SUMMARY
Activity: very low

Flares: none.

Observed 10.7 cm flux/Equivalent Sunspot Number : 105/054

1B. SOLAR FORECAST
22 February 23 February 24 February
Activity Low Low Low
Fadeouts None expected None expected None expected

Forecast 10.7 cm flux/Equivalent Sunspot Number : 105/054

1C. SOLAR COMMENT
None.

2A. MAGNETIC SUMMARY
Geomagnetic field at Learmonth : major storm

Estimated Indices : A K Observed A Index 20 February
Learmonth 45 2126 6664
Fredericksburg 54 13
Planetary 60 13

2B. MAGNETIC FORECAST
DATE Ap CONDITIONS
22 Feb 50 Minor storm.
23 Feb 35 Active to minor storm.
24 Feb 20 Active to minor storm.

2C. MAGNETIC COMMENT
Shock in field was observed at 0900Z 135nT. Major storm levels
observed after shock. Shock due to M4 flare.

3A. GLOBAL HF PROPAGATION SUMMARY
LATITUDE BAND
DATE LOW MIDDLE HIGH

21 Feb fair-normal fair-normal poor-fair
PCA Event : In progress.
3B. GLOBAL HF PROPAGATION FORECAST
LATITUDE BAND
DATE LOW MIDDLE HIGH
22 Feb poor poor poor
23 Feb fair poor poor
24 Feb normal fair poor
3C. GLOBAL HF PROPAGATION COMMENT
Continuing geomagnetic activity is degrading global HF propagation
conditions. PCA event has degraded high lat HF comms.

4A. AUSTRALIAN REGION IONOSPHERIC SUMMARY
MUFs at Sydney were 10-20% enhanced until dawn then depressed 10-20%

T index: 64

4B. AUSTRALIAN REGION IONOSPHERIC FORECAST
DATE T-index MUFs
22 Feb 0 About 20% below predicted monthly values.
23 Feb 15 About 15% below predicted monthly values.
24 Feb 20 About 15% below predicted monthly values.

Predicted Monthly T Index for February is 30.

4C. AUSTRALIAN REGION COMMENT
Degraded and depressed HF conditions are expected over the next
three days due to recurrent/flare and dissappearing filament
activity.
--
Dave Horsfall (VK2KFU) VK2KFU @ VK2OP.NSW.AUS.OC PGP 2.3
dave@esi.COM.AU ...munnari!esi.COM.AU!dave available

283. Satellite progs on World

Newsgroup: rec.radio.amateur.space
Date: 1994-02-22 04:14:06 UTC
From: wy1z@netcom.com
Message-ID: <wy1zCLLyFJ.IpF@netcom.com>
Source record: 27937
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

I have now placed some satellite tracking programs on World:

- stsplus.zip

- stsorbit.zip

- traksat {trak300a.zip & trak300b.zip} (latest version of traksat)

They are available via anonymous FTP via

ftp ftp.std.com:/pub/hamradio/pc/satellite

If you have any problems, questions, or comments, please e-mail them to me.

I tried very hard to search for stsplus through many archie searches, and
only found one site which carried it. I hope that by making it available
on World it will be easier to obtain.

73,
Scott, WY1Z

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==============================================================================
| Scott Ehrlich Internet: wy1z@neu.edu BITNET: wy1z@NUHUB |
| Amateur Radio: wy1z AX.25: wy1z@k1ugm.ma.usa.na |
|----------------------------------------------------------------------------|
| Maintainer of the Boston Amateur Radio Club hamradio FTP area on |
| the World - ftp.std.com pub/hamradio |
==============================================================================

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==============================================================================
| Scott Ehrlich Internet: wy1z@neu.edu BITNET: wy1z@NUHUB |
| Amateur Radio: wy1z AX.25: wy1z@k1ugm.ma.usa.na |
|----------------------------------------------------------------------------|
| Maintainer of the Boston Amateur Radio Club hamradio FTP area on |
| the World - ftp.std.com pub/hamradio |
==============================================================================
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284. Anyone copy DOVE telemetry last week?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-22 16:16:59 UTC
From: genewill@efn.org
Message-ID: <CLMvwC.8u8@efn.org>
Source record: 27938

My 2meter TNC was QRT for a little over a week, so I missed some of the DOVE telemetry. Am looking for the callsigns of those hams having reported hearing DOVE. The last calls I copied were 8th Feb 1994 DOVE reports have been received from : CT1FAK DC1RT DG5AOF DH5DAH DJ5XO EA1BCU EA2ABF EA2BFF EB8AUB F11AFX F11BYB G2UK Then I pick up again with:
19th Feb 1994 DOVE reports have
been received from : KB4CYC KB5YVF KB7QLY KC1WD KC2SF KC3H KC4ZRH KC6ROL KB2BD KD4GAR KD4GHQ KD4SHL KD4UPF KD6NEW KI0G KM6JV KMA1JL KR5J KX7L LA5VX

Can anyone help with the calls between G2UK and KB4CYC? (Yes, I know this is cheating . . . I should be copying from DOVE.) TIA!
73 . . . . ._ Gene K7DBV

285. MIR QSLs

Newsgroup: rec.radio.amateur.space
Date: 1994-02-23 13:20:45 UTC
From: rinderbitzen@arrl.org
Message-ID: <1994Feb23.132045.5072@arrl.org>
Source record: 27939

Have you made successful contact with the Mir Space Station and
U9MIR (Viktor)?

I'm hunting for the QSL address and information for U9MIR. I am
particularly interested in responses from anyone who has
successfully obtained a card.

Please reply to ead@arrl.org. Thank you!

Sincerely and 73,

Bob Inderbitzen, NQ1R
Assistant to the Manager
ARRL Educational Activities

Robert J Inderbitzen, NQ1R | voice: (203) 666-1541 X213
Educational Activities Department | fax: (203) 665-7531
American Radio Relay League | email: rinderbi@arrl.org
225 Main Street | ARRL BBS: (203) 666-0578
Newington, CT 06111 USA | CompuServe: 70007,3373

286. Satelite operating list?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-23 20:49:00 UTC
From: stephen@hpdmlge.boi.hp.com
Message-ID: <CLp35p.EL9@boi.hp.com>
Source record: 27940

I would like to get into working satelites and I was wondering if there was a list of all the amateur satelites with frequencies, modes and schedules for use. I have listened to RS-10/11 and RS-12/13 on several passes and I am very excited about this aspect of the hobby. Does anyone have a "favorite" satelite? Is there a special set of rules for working satelites? Is all of this in a FAQ somewhere?

Thanks for your patience.

--

____ ____
| / /_ __\ | Disk Stephen Holmstead All comments (c)1992
| | / / /_/ | | Memory ...!hplabs!hpdmd48!stephen Opinions are mine,
|___\ / /___| Division stephen@mail.boi.hp.com not my employer's.

287. ORBS$056.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 13:36:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-056.o.1994@ampr.org>
Source record: 27941
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-056.O
Orbital Elements 056.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SAT
FROM WA5QGD FORT WORTH,TX February 25, 1994
BID: $ORBS-056.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94051.71420822
Element set: 262
Inclination: 027.2097 deg
RA of node: 340.7072 deg
Eccentricity: 0.6035253
Arg of perigee: 156.2883 deg
Mean anomaly: 250.5966 deg
Mean motion: 02.05880368 rev/day
Decay rate: 3.95e-06 rev/day^2
Epoch rev: 8038
Checksum: 299

Satellite: UO-11
Catalog number: 14781
Epoch time: 94044.54889300
Element set: 664
Inclination: 97.7907 deg
RA of node: 65.0254 deg
Eccentricity: 0.0011279
Arg of perigee: 310.7761 deg
Mean anomaly: 49.2455 deg
Mean motion: 14.69144313 rev/day
Decay rate: 3.63e-06 rev/day^2
Epoch rev: 53215
Checksum: 306

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94054.03951801
Element set: 870
Inclination: 082.9206 deg
RA of node: 053.2129 deg
Eccentricity: 0.0011765
Arg of perigee: 346.0336 deg
```

Mean anomaly: 014.1062 deg
Mean motion: 13.72331508 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 33425
Checksum: 264

Satellite: AO-13
Catalog number: 19216
Epoch time: 94048.56858325
Element set: 880
Inclination: 057.8103 deg
RA of node: 267.6554 deg
Eccentricity: 0.7205099
Arg of perigee: 335.0990 deg
Mean anomaly: 002.8997 deg
Mean motion: 02.09722235 rev/day
Decay rate: -2.077e-05 rev/day^2
Epoch rev: 4350
Checksum: 331

Satellite: FO-20
Catalog number: 20480
Epoch time: 94046.42832899
Element set: 659
Inclination: 99.0216 deg
RA of node: 221.3367 deg
Eccentricity: 0.0539917
Arg of perigee: 255.4010 deg
Mean anomaly: 98.6634 deg
Mean motion: 12.83223845 rev/day
Decay rate: -1.4e-07 rev/day^2
Epoch rev: 18851
Checksum: 320

Satellite: AO-21
Catalog number: 21087
Epoch time: 94053.96716387
Element set: 432
Inclination: 082.9410 deg
RA of node: 227.2228 deg
Eccentricity: 0.0036055
Arg of perigee: 043.1176 deg
Mean anomaly: 317.3312 deg
Mean motion: 13.74533568 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 15389
Checksum: 300

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94044.66379265

Element set: 662
Inclination: 82.9220 deg
RA of node: 103.0678 deg
Eccentricity: 0.0030946
Arg of perigee: 91.8517 deg
Mean anomaly: 268.6203 deg
Mean motion: 13.74034946 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 15168
Checksum: 314

Satellite: ARSENE
Catalog number: 22654
Epoch time: 93338.80803910
Element set: 243
Inclination: 1.4104 deg
RA of node: 113.5274 deg
Eccentricity: 0.2936576
Arg of perigee: 161.9838 deg
Mean anomaly: 210.8642 deg
Mean motion: 1.42202044 rev/day
Decay rate: -8.7e-07 rev/day^2
Epoch rev: 299
Checksum: 278

/EX

288. ORBS$056.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 13:38:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-056.d.1994@ampr.org>
Source record: 27942
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-056.D
Orbital Elements 056.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX February 25, 1994
BID: $ORBS-056.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94046.18347456
Element set: 964
Inclination: 98.5953 deg
RA of node: 132.5942 deg
Eccentricity: 0.0010599
Arg of perigee: 186.2827 deg
Mean anomaly: 173.8225 deg
Mean motion: 14.29823413 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21215
Checksum: 317

Satellite: AO-16
Catalog number: 20439
Epoch time: 94045.75388848
Element set: 764
Inclination: 98.6038 deg
RA of node: 133.2765 deg
Eccentricity: 0.0010934
Arg of perigee: 188.0238 deg
Mean anomaly: 172.0765 deg
Mean motion: 14.29879034 rev/day
Decay rate: 7.6e-07 rev/day^2
Epoch rev: 21210
Checksum: 328

Satellite: DO-17
Catalog number: 20440
Epoch time: 94045.23034447
Element set: 763
Inclination: 98.6058 deg
RA of node: 133.0443 deg
Eccentricity: 0.0010965
Arg of perigee: 189.4352 deg
```

Mean anomaly: 170.6623 deg
Mean motion: 14.30017107 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 21204
Checksum: 266

Satellite: WO-18
Catalog number: 20441
Epoch time: 94045.76328214
Element set: 765
Inclination: 98.6054 deg
RA of node: 133.5798 deg
Eccentricity: 0.0011505
Arg of perigee: 188.3662 deg
Mean anomaly: 171.7330 deg
Mean motion: 14.29993172 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 21212
Checksum: 309

Satellite: LO-19
Catalog number: 20442
Epoch time: 94045.74960276
Element set: 763
Inclination: 98.6048 deg
RA of node: 133.7927 deg
Eccentricity: 0.0011921
Arg of perigee: 187.6862 deg
Mean anomaly: 172.4137 deg
Mean motion: 14.30087334 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 21213
Checksum: 308

Satellite: UO-22
Catalog number: 21575
Epoch time: 94046.13690949
Element set: 465
Inclination: 98.4466 deg
RA of node: 123.0432 deg
Eccentricity: 0.0007219
Arg of perigee: 301.1937 deg
Mean anomaly: 58.8542 deg
Mean motion: 14.36890610 rev/day
Decay rate: 1.13e-06 rev/day^2
Epoch rev: 13555
Checksum: 302

Satellite: KO-23
Catalog number: 22077
Epoch time: 94046.40390865

Element set: 360
Inclination: 66.0810 deg
RA of node: 174.9628 deg
Eccentricity: 0.0009874
Arg of perigee: 317.5713 deg
Mean anomaly: 42.4539 deg
Mean motion: 12.86284764 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7112
Checksum: 311

Satellite: AO-27
Catalog number: 22825
Epoch time: 94046.21545311
Element set: 261
Inclination: 98.6626 deg
RA of node: 123.1936 deg
Eccentricity: 0.0008062
Arg of perigee: 202.2052 deg
Mean anomaly: 157.8775 deg
Mean motion: 14.27607193 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 2028
Checksum: 289

Satellite: IO-26
Catalog number: 22826
Epoch time: 94042.21058899
Element set: 261
Inclination: 98.6649 deg
RA of node: 119.2441 deg
Eccentricity: 0.0008529
Arg of perigee: 216.1988 deg
Mean anomaly: 143.8612 deg
Mean motion: 14.27708814 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 1971
Checksum: 325

Satellite: KO-25
Catalog number: 22830
Epoch time: 94045.75293537
Element set: 264
Inclination: 98.5674 deg
RA of node: 121.3071 deg
Eccentricity: 0.0011406
Arg of perigee: 172.0390 deg
Mean anomaly: 188.0975 deg
Mean motion: 14.28033386 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 2022

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Checksum: 286

/EX
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289. ORBS$056.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 13:41:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-056.w.1994@ampr.org>
Source record: 27943
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-056.W
Orbital Elements 056.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SAT
FROM WA5QGD FORT WORTH,TX February 25, 1994
BID: $ORBS-056.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94054.00302709
Element set: 723
Inclination: 099.0635 deg
RA of node: 103.0735 deg
Eccentricity: 0.0015048
Arg of perigee: 181.2398 deg
Mean anomaly: 178.9245 deg
Mean motion: 14.13590789 rev/day
Decay rate: 9.6e-07 rev/day^2
Epoch rev: 47421
Checksum: 311

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94054.04773810
Element set: 621
Inclination: 098.5080 deg
RA of node: 066.5227 deg
Eccentricity: 0.0013117
Arg of perigee: 304.7185 deg
Mean anomaly: 055.3324 deg
Mean motion: 14.24867071 rev/day
Decay rate: 2.20e-06 rev/day^2
Epoch rev: 38635
Checksum: 293

Satellite: MET
Catalog number: 18820
Epoch time: 94046.33979358
Element set: 262
Inclination: 82.5401 deg
RA of node: 5.5070 deg
Eccentricity: 0.0016642
Arg of perigee: 157.5160 deg
```

Mean anomaly: 202.6730 deg
Mean motion: 13.84706663 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 30549
Checksum: 289

Satellite: MET
Catalog number: 19336
Epoch time: 94039.99790931
Element set: 262
Inclination: 82.5380 deg
RA of node: 54.3969 deg
Eccentricity: 0.0015730
Arg of perigee: 222.0779 deg
Mean anomaly: 137.9138 deg
Mean motion: 13.16964807 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26638
Checksum: 335

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94053.99344407
Element set: 528
Inclination: 099.1598 deg
RA of node: 040.1607 deg
Eccentricity: 0.0012083
Arg of perigee: 093.0795 deg
Mean anomaly: 267.2327 deg
Mean motion: 14.12962203 rev/day
Decay rate: 3.10e-06 rev/day^2
Epoch rev: 27909
Checksum: 303

Satellite: MET
Catalog number: 19851
Epoch time: 94053.01405594
Element set: 263
Inclination: 082.5171 deg
RA of node: 235.7306 deg
Eccentricity: 0.0014002
Arg of perigee: 188.3029 deg
Mean anomaly: 171.8434 deg
Mean motion: 13.84356715 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 25175
Checksum: 295

Satellite: MET
Catalog number: 20305
Epoch time: 94052.02689974

Element set: 989
Inclination: 082.5516 deg
RA of node: 350.2887 deg
Eccentricity: 0.0006980
Arg of perigee: 212.2401 deg
Mean anomaly: 147.8826 deg
Mean motion: 13.04401818 rev/day
Decay rate: .00000000 rev/day^2
Epoch rev: 20775
Checksum: 292

Satellite: MET
Catalog number: 20670
Epoch time: 94040.79306496
Element set: 762
Inclination: 82.5504 deg
RA of node: 309.6649 deg
Eccentricity: 0.0016176
Arg of perigee: 139.0978 deg
Mean anomaly: 221.1403 deg
Mean motion: 13.84188455 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18299
Checksum: 328

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94054.01861085
Element set: 900
Inclination: 098.8401 deg
RA of node: 077.7921 deg
Eccentricity: 0.0014098
Arg of perigee: 329.5916 deg
Mean anomaly: 030.4941 deg
Mean motion: 14.01320674 rev/day
Decay rate: .00000000 rev/day^2
Epoch rev: 17771
Checksum: 283

Satellite: MET
Catalog number: 20826
Epoch time: 94054.04864341
Element set: 770
Inclination: 082.5221 deg
RA of node: 236.7821 deg
Eccentricity: 0.0013725
Arg of perigee: 010.4814 deg
Mean anomaly: 349.7177 deg
Mean motion: 13.83573158 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 17197

Checksum: 306

Satellite: MET
Catalog number: 21232
Epoch time: 94044.59202931
Element set: 670
Inclination: 82.5391 deg
RA of node: 256.9674 deg
Eccentricity: 0.0013673
Arg of perigee: 130.9218 deg
Mean anomaly: 229.3059 deg
Mean motion: 13.16460015 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13509
Checksum: 285

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94054.09638815
Element set: 933
Inclination: 098.6271 deg
RA of node: 084.3280 deg
Eccentricity: 0.0012752
Arg of perigee: 206.9837 deg
Mean anomaly: 153.1243 deg
Mean motion: 14.22371048 rev/day
Decay rate: 1.95e-06 rev/day^2
Epoch rev: 14431
Checksum: 293

Satellite: MET
Catalog number: 21655
Epoch time: 94053.93518236
Element set: 675
Inclination: 082.5545 deg
RA of node: 197.4162 deg
Eccentricity: 0.0014020
Arg of perigee: 122.7542 deg
Mean anomaly: 237.5449 deg
Mean motion: 13.16822729 rev/day
Decay rate: -4.48e-06 rev/day^2
Epoch rev: 12142
Checksum: 304

Satellite: MET
Catalog number: 22782
Epoch time: 94054.05930183
Element set: 270
Inclination: 082.5499 deg
RA of node: 296.8811 deg
Eccentricity: 0.0022218

```
Arg of perigee: 184.0206 deg
Mean anomaly: 176.1276 deg
Mean motion: 13.83000854 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 02431
Checksum: 288

/EX
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290. ORBS$056.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 13:44:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-056.m.1994@ampr.org>
Source record: 27944
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-056.M
Orbital Elements 056.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SAT
FROM WA5QGD FORT WORTH,TX February 25, 1994
BID: $ORBS-056.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94045.75585944
Element set: 254
Inclination: 98.6608 deg
RA of node: 122.7699 deg
Eccentricity: 0.0009759
Arg of perigee: 191.0097 deg
Mean anomaly: 169.0872 deg
Mean motion: 14.28003980 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 2022
Checksum: 326

Satellite: MIR
Catalog number: 16609
Epoch time: 94054.03980340
Element set: 146
Inclination: 051.6181 deg
RA of node: 038.8441 deg
Eccentricity: 0.0004691
Arg of perigee: 353.6232 deg
Mean anomaly: 006.5389 deg
Mean motion: 15.60416322 rev/day
Decay rate: 2.2745e-04 rev/day^2
Epoch rev: 45824
Checksum: 287

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94053.98888941
Element set: 445
Inclination: 028.4687 deg
RA of node: 249.4717 deg
Eccentricity: 0.0005902
Arg of perigee: 337.3920 deg
```

Mean anomaly: 022.6910 deg
Mean motion: 14.90490673 rev/day
Decay rate: 1.784e-05 rev/day^2
Epoch rev: 01233
Checksum: 316

Satellite: GRO
Catalog number: 21225
Epoch time: 94045.19676059
Element set: 66
Inclination: 28.4619 deg
RA of node: 5.5021 deg
Eccentricity: 0.0003857
Arg of perigee: 262.4247 deg
Mean anomaly: 97.5914 deg
Mean motion: 15.40075712 rev/day
Decay rate: 4.645e-05 rev/day^2
Epoch rev: 3795
Checksum: 300

Satellite: UARS
Catalog number: 21701
Epoch time: 94050.07315151
Element set: 479
Inclination: 056.9834 deg
RA of node: 272.3681 deg
Eccentricity: 0.0002165
Arg of perigee: 100.1172 deg
Mean anomaly: 260.0857 deg
Mean motion: 14.96377326 rev/day
Decay rate: 3.162e-05 rev/day^2
Epoch rev: 13325
Checksum: 272

/EX

291. ORBS$056.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 13:47:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-056.n.1994@ampr.org>
Source record: 27945
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-056.N
2Line Orbital Elements 056.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SAT
FROM WA5QGD FORT WORTH,TX February 25, 1994
BID: $ORBS-056.N

DECODE 2-LINE ELSETS WIT
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058 B 94051.71420822 .00000395 00000-0 99999-4 0 2625
2 14129 027.2097 340.7072 6035253 156.2883 250.5966 02.05880368 80388
UO-11
1 14781U 84021B 94044.54889300 .00000363 00000-0 69607-4 0 6647
2 14781 97.7907 65.0254 0011279 310.7761 49.2455 14.69144313532150
RS-10/11
1 18129U 87054 A 94054.03951801 .00000025 00000-0 27607-4 0 8705
2 18129 082.9206 053.2129 0011765 346.0336 014.1062 13.72331508334251
AO-13
1 19216U 88051 B 94048.56858325 -.00002077 00000-0 00000 0 0 8803
2 19216 057.8103 267.6554 7205099 335.0990 002.8997 02.09722235 43500
FO-20
1 20480U 90013C 94046.42832899 -.00000014 00000-0 49346-4 0 6594
2 20480 99.0216 221.3367 0539917 255.4010 98.6634 12.83223845188515
AO-21
1 21087U 91006 A 94053.96716387 .00000046 00000-0 48472-4 0 4323
2 21087 082.9410 227.2228 0036055 043.1176 317.3312 13.74533568153891
RS-12/13
1 21089U 91007A 94044.66379265 .00000043 00000-0 29527-4 0 6625
2 21089 82.9220 103.0678 0030946 91.8517 268.6203 13.74034946151682
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000 0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
UO-14
1 20437U 90005B 94046.18347456 .00000060 00000-0 40471-4 0 9649
2 20437 98.5953 132.5942 0010599 186.2827 173.8225 14.29823413212157
AO-16
1 20439U 90005D 94045.75388848 .00000076 00000-0 46533-4 0 7643
```

```
2 20439 98.6038 133.2765 0010934 188.0238 172.0765 14.29879034212109
DO-17
1 20440U 90005E 94045.23034447 .00000070 00000-0 44132-4 0 7637
2 20440 98.6058 133.0443 0010965 189.4352 170.6623 14.30017107212047
WO-18
1 20441U 90005F 94045.76328214 .00000059 00000-0 39826-4 0 7657
2 20441 98.6054 133.5798 0011505 188.3662 171.7330 14.29993172212124
LO-19
1 20442U 90005G 94045.74960276 .00000064 00000-0 41740-4 0 7638
2 20442 98.6048 133.7927 0011921 187.6862 172.4137 14.30087334212130
UO-22
1 21575U 91050B 94046.13690949 .00000113 00000-0 52716-4 0 4657
2 21575 98.4466 123.0432 0007219 301.1937 58.8542 14.36890610135556
KO-23
1 22077U 92052B 94046.40390865 -.00000037 00000-0 10000-3 0 3601
2 22077 66.0810 174.9628 0009874 317.5713 42.4539 12.86284764 71129
AO-27
1 22825U 93061C 94046.21545311 .00000058 00000-0 41460-4 0 2617
2 22825 98.6626 123.1936 0008062 202.2052 157.8775 14.27607193 20284
IO-26
1 22826U 93061D 94042.21058899 .00000053 00000-0 39268-4 0 2612
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
KO-25
1 22830U 93061H 94045.75293537 .00000053 00000-0 38624-4 0 2647
2 22830 98.5674 121.3071 0011406 172.0390 188.0975 14.28033386 20227
NOAA-9
1 15427U 84123 A 94054.00302709 .00000096 00000-0 50913-4 0 7232
2 15427 099.0635 103.0735 0015048 181.2398 178.9245 14.13590789474213
NOAA-10
1 16969U 86073 A 94054.04773810 .00000220 00000-0 94334-4 0 6210
2 16969 098.5080 066.5227 0013117 304.7185 055.3324 14.24867071386359
MET-2/17
1 18820U 88005A 94046.33979358 .00000030 00000-0 12997-4 0 2628
2 18820 82.5401 5.5070 0016642 157.5160 202.6730 13.84706663305497
MET-3/2
1 19336U 88064A 94039.99790931 .00000051 00000-0 10000-3 0 2623
2 19336 82.5380 54.3969 0015730 222.0779 137.9138 13.16964807266383
NOAA-11
1 19531U 88089 A 94053.99344407 .00000310 00000-0 16669-3 0 5286
2 19531 099.1598 040.1607 0012083 093.0795 267.2327 14.12962203279093
MET-2/18
1 19851U 89018 A 94053.01405594 -.00000008 00000-0 00000 0 0 2631
2 19851 082.5171 235.7306 0014002 188.3029 171.8434 13.84356715251755
MET-3/3
1 20305U 89086 A 94052.02689974 .00000000 00000-0 99999-4 0 9894
2 20305 082.5516 350.2887 0006980 212.2401 147.8826 13.04401818207754
MET-2/19
1 20670U 90057A 94040.79306496 .00000024 00000-0 79036-5 0 7621
2 20670 82.5504 309.6649 0016176 139.0978 221.1403 13.84188455182995
FY-1/2
```

```
1 20788U 90081 A 94054.01861085 .00000000 00000-0 00000 0 0 9005
2 20788 098.8401 077.7921 0014098 329.5916 030.4941 14.01320674177719
MET-2/20
1 20826U 90086 A 94054.04864341 .00000069 00000-0 63290-4 0 7709
2 20826 082.5221 236.7821 0013725 010.4814 349.7177 13.83573158171972
MET-3/4
1 21232U 91030A 94044.59202931 .00000051 00000-0 10000-3 0 6701
2 21232 82.5391 256.9674 0013673 130.9218 229.3059 13.16460015135098
NOAA-12
1 21263U 91032 A 94054.09638815 .00000195 00000-0 87715-4 0 9336
2 21263 098.6271 084.3280 0012752 206.9837 153.1243 14.22371048144310
MET-3/5
1 21655U 91056 A 94053.93518236 -.00000448 00000-0 99999-4 0 6755
2 21655 082.5545 197.4162 0014020 122.7542 237.5449 13.16822729121425
MET-2/21
1 22782U 93055 A 94054.05930183 .00000038 00000-0 34746-4 0 2705
2 22782 082.5499 296.8811 0022218 184.0206 176.1276 13.83000854024313
POSAT
1 22829U 93061G 94045.75585944 .00000072 00000-0 46760-4 0 2541
2 22829 98.6608 122.7699 0009759 191.0097 169.0872 14.28003980 20229
MIR
1 16609U 86017 A 94054.03980340 .00022745 00000-0 27089-3 0 1466
2 16609 051.6181 038.8441 0004691 353.6232 006.5389 15.60416322458242
HUBBLE
1 20580U 90037 B 94053.98888941 .00001784 00000-0 17844-3 0 4453
2 20580 028.4687 249.4717 0005902 337.3920 022.6910 14.90490673012331
GRO
1 21225U 91027B 94045.19676059 .00004645 00000-0 10629-3 0 661
2 21225 28.4619 5.5021 0003857 262.4247 97.5914 15.40075712 37958
UARS
1 21701U 91063 B 94050.07315151 .00003162 00000-0 27654-3 0 4793
2 21701 056.9834 272.3681 0002165 100.1172 260.0857 14.96377326133253
/EX
```

292. RDSS and CDMA

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 14:41:11 UTC
From: bergst@birch.ee.vt.edu
Message-ID: <2kl2m7$54o@solaris.cc.vt.edu>
Source record: 27958

As part of a course I'm taking, we are studying a dedicated RDSS satellite system which provides RDSS services and two-way messaging. Being a controls student, some of the satellite communcations issues are unfamiliar to me. Would you please answer the following questions?

The original system proposed to have 3 satellites each with 8 beam antennas to cover the continental US (CONUS?). The transmission method is to be CDMA. Now, the system is to use 4 single beam satellites to replace two of the 8 beam satellites.

It has been said that this configuration will reduce the number of RDSS systems which can occupy the allocated bandwidth. Why? (a 70% reduction according my information)

The smaller satellites will have have smaller operating powers. This is said to reduce the number of simutaneous users of the CDMA system. Again...why?

Thank you in advance for any help you provide,

Robert Bergstrom

P.S. The course is on financing and operation technology companies. Unfortunately, being a non-engineering course, the technical arguements are a bit sketchy, and I'm out of my element.

293. Whereabouts of Instant Track "B" Patch

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 16:37:00 UTC
From: dg651@cleveland.Freenet.Edu
Message-ID: <2kl9fc$hob@usenet.INS.CWRU.Edu>
Source record: 27946

The following paragraph discussing the "B" patch for the InstantTrac program was found a the archive.afit.af.mil site. The patch is not in the pub/space directory but is available via the Celestial BBS (TS Kelso, SYSOP).

>[1] ITPATCH2.ZIP 9111 5-May-1992 01:53
> Patch #2 to InstantTrack 1.00. This program updates InstantTrac
> or 1.00a to version 1.00b. This patch is mandatory for anybody
> installed Patch #1, because it corrects a slightly dangerous bug
> Patch #1. Like Patch #1, this patch solves the problem of different
> NASA Keplerian elements file formats by permitting either format
> read in by InstantTrack.

Is there an ftp site with InstantTrac 1.00b version/patch?

Thanks for any leads.

294. * SpaceNews 28-Feb-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-02-25 19:04:20 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0228.1994@ampr.org>
Source record: 27947
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0228
* SpaceNews 28-Feb-94 *

BID: $SPC0228

=========
SpaceNews
=========

MONDAY FEBRUARY 28, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* 137 MHz WXSAT NEWS *
======================
NOAA POLAR ORBITING SAT

[X] NOAA-09 Transmitting normal APT
[X] NOAA-10 Transmitting normal APT
[X] NOAA-11 Transmitting normal APT
[X] NOAA-12 Transmitting normal APT
[ ] NOAA-13 Inactive 137.620 MHz
Note: The NOAA Command Center has lost control of this satellite, and
the recovery attempts have been suspended.

MET

[ ] MET
[ ] MET
[ ] MET
[ ] MET
[ ] MET
[X] MET
Note: Satellite not heard during night passes.

[ ] MET
[X] MET
Note: Satellite not heard during night passes.

[ ] MET
[X] MET
Note: Satellite not heard during night passes.

[Info via HP2DFA]

* HF PBBS UPDATE *
==================
The WT0N-3 HF Packet Radio BBS in St. Paul, MN on 10.127 MHz now also supports PACTOR communications under the callsign of WT0N. The BBS is available for packet operations Monday through Saturday from 1600 UTC until 2300 UTC. PACTOR operations are currently scheduled during the hours of 23:30 UTC and 04:00 UTC. The system carries all AMSAT bulletins and Keplerian data for OSCAR satellites. It also carries other satellite related items such as "SpaceNews".

The BBS is currently set up as an experiment. Comments and suggestions should be directed to the sysop, BJ Arts at any one of the following addresses:

Packet: WT0N@WB0GDB.#STP.MN.USA.NOAM
Internet: BJARTS@STTHOMAS.EDU
HF PACKET: WT0N-3 (ON 30 MET
HF PACTOR: WT0N

[Info via WT0N]

* RS-15 NEWS *
==============
According to reliable sources close to the project, a launch date for RS-15 has still not been firmed up, and the official presentation before the Russian Space Agency has been delayed until 20-Mar-94.

The following is some data pertaining to the transponder carried on RS-15 and its orbital charateristics:

uplink: 145.857 - 145.897 MHz
downlink: 29.351 - 29.397 MHz
beacon 29.398 MHz.....P = 0.4/1.2 W
beacon 29.353 MHz.....P = 0.4/1.2 W
antenna.....1/4 wavelength
height.....2,300 km
inclination.....67 degrees

[Info via Gustavo, LW2DTZ]

* OSCAR TALK AT BERKELEY *
==========================
On Thursday, March 3rd, at 7:30 PM, Professor Robert Twiggs of Stanford's newly formed small satellite department will be giving a talk about their amateur radio based satellite program. Professor Twiggs's extensive background in amateur satellites at Weber State University included OSCAR WO-18 and NUSAT I. His positive experience with including OSCAR activities in the education curriculum has led him to establish a program at Stanford. He hopes to get faculty, staff, students and local volunteer engineers to work together in a similar manner as was done at WSU to design, build, launch and operate microsatellites at Stanford. Professor Twiggs will be discussing possible payloads for Stanford's amateur satellites and science payloads for the larger buses that they would like to build.

The talk will be held in downtown Berkeley, CA at UCB's Center for EUV Astrophysics, 2150 Kittredge Street. The CEA is between Shattuck and Oxford Streets, diagonally across from the California Cinema.

A tour of the CEA, including the Science Operations Center for NASA's Extreme Ultraviolet Explorer satellite (EUVE), will be available for those arriving at 7:00 PM.

Will Marchant Center for Extreme Ultraviolet Astrophysics
marchant@cea.berkeley.edu University of California
KC6ROL@N0ARY 2150 Kittredge St., Berkeley, CA 94720 USA

* FO-20 SCHEDULE *
==========
The FO-20 command station announced that a slight malfunction in the onboard command system had been detected. As a result, analog mode operation arranged from 09-Feb-94 will be performed on schedule, but there is a possibility of interruption due to satellite ground station control.

The present schedule is as announced before:

Analog mode:
09-Feb-94 07:15 -to- 16-Feb-94 07:40 UTC
23-Feb-94 08:05 -to- 02-Mar-94 06:40 UTC
09-Mar-94 07:05 -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 -to- 30-Mar-94 08:15 UTC

Digital mode: Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* SpaceNews VIA SAT
==========
SpaceNews distribution via the Amateur Packet Radio Network has been improved recently with the help of high-speed "Pacsat" satellites. These polar orbiting satellites now make SpaceNews available to every inch of the planet several times daily at 9600 bps. My sincere thanks to W3QNS for uploading copies of SpaceNews to the KIT
them available for all KO-23 satellite users.

* CONGRATULATIONS! *
==========
Congratulations to Jeff Ward, G0/K8KA, who recently earned his Doctorate degree. Jeff has been instrumental in the design of not only OSCAR satellite hardware, but also the ground station software that is used for Pacsat communications. His work has had a great impact on emerging microsatellite and digital communications technology, and we all look forward to working with him in future satellite projects and in expanding the communications resources available to Amateur Radio operators worldwide.

* THANKS! *
==========
Thanks to all those who sent QSL cards, letters, and messages of appreciation regarding SpaceNews, especially:

N2HZK KB5ROV EI6EH G8INE

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

295. Re: Whereabouts of Instant Track "B" Patch

Newsgroup: rec.radio.amateur.space
Date: 1994-02-26 03:39:35 UTC
From: somers@satsar.rmc.ca
Message-ID: <2kmg9n$rbn@cs6.rmc.ca>
Source record: 27948

Curtis W. Roelle (dg651@cleveland.Freenet.Edu) wrote:

: Is there an ftp site with InstantTrac 1.00b version/patch?

pc.usl.edu in pub/ham/sat

296. Info on Phase 3D + AMSAT?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-26 15:53:19 UTC
From: bruces@mpd.tandem.com
Message-ID: <1994Feb26.155319.15497@integrity.uucp>
Source record: 27949

I'm looking for any information that may be available via ftp on
AMSAT (specifically the new Phase 3D info, like frequecies,
capabilites, etc). Can some one tell me if this is available?

Thanks
--
| Bruce Sawtelle AX.25 : W3NJ @ N5LJF.TX.USA.NA |
| Tandem Computers, Inc. Internet : bruces @ mpd.tandem.com |
| 14231 Tandem Blvd. USENET : halley!bruces |
| Austin, Tx 78728 TCP/IP : 44.76.1.42 (w3nj.ampr.org) |

297. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-02-26 22:45:17 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.762302717@afit.af.mil>
Source record: 27950
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.info on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (also updated daily) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a eleven-character name.

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BST
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

298. Two-Line Orbital Element Sets (TLE348)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-26 22:47:57 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.762302877@afit.af.mil>
Source record: 27951

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #348 -
Alouette 1
1 00424U 62049 94045.45827772 .00000075 00000-0 77418-4 0 9662
2 00424 80.4610 46.0904 0024601 70.8475 289.5329 13.67797961565626
ATS 3
1 03029U 67111A 94043.32884620 -.00000118 00000-0 10000-3 0 1642
2 03029 14.5668 8.8081 0011454 266.6574 239.6985 1.00272226 96180
Cosmos 398
1 04966U 71016 A 94056.00480181 .00146134 00000-0 31455-3 0 289
2 04966 051.4580 042.7710 1142179 037.1473 330.3858 13.61146797757308
Starlette
1 07646U 75010A 94045.09418492 -.00000105 00000-0 28546-4 0 7595
2 07646 49.8290 279.1007 0206127 289.6451 68.2305 13.82185755960820
LAGEOS
1 08820U 76039A 94045.65107050 .00000012 00000-0 10000-3 0 9660
2 08820 109.8416 93.6376 0044387 311.4872 48.2109 6.38664329159326
ETS-2
1 09852U 77014A 94044.81965196 -.00000343 00000-0 10000-3 0 9499
2 09852 11.9332 43.0048 0000834 353.5814 154.4927 1.00006089 9429
GOES 2
1 10061U 77048 A 94055.08180404 .00000000 00000-0 99999-4 0 2950
2 10061 010.9803 047.1876 0002157 352.6545 007.3495 01.00259419005980
IUE
1 10637U 78012 A 94054.01578726 .00000000 00000-0 99999-4 0 9778
2 10637 034.4454 096.8442 1312883 032.6049 334.8831 01.00301496011585
GPS BI-01
1 10684U 78020 A 94053.12422953 .00000008 00000-0 99999-4 0 2524
2 10684 064.5521 048.9140 0063690 163.4729 196.7705 01.98069723102650
GPS BI-02
1 10893U 78047 A 94054.18191706 -.00004056 00000-0 99999-4 0 471
2 10893 063.6183 288.0734 0212170 013.8551 346.7529 02.01613333115777
```

```
GOES 3
1 10953U 78062 A 94055.19794699 .00000000 00000-0 99999-4 0 2787
2 10953 009.9337 049.8686 0005545 107.7336 252.3338 01.00274743010597
SeaSat 1
1 10967U 78064A 94046.23754017 .00000046 00000-0 59855-4 0 2663
2 10967 108.0019 209.8284 0001772 238.6298 121.4669 14.37923306818837
GPS BI-03
1 11054U 78093A 94041.63598018 -.00000004 00000-0 10000-3 0 1593
2 11054 63.2990 285.4847 0043212 176.1309 183.9671 1.93505120112060
Nimbus 7
1 11080U 78098A 94045.17243193 -.00000001 00000-0 37021-4 0 3661
2 11080 99.0727 293.2811 0009628 100.9261 259.2975 13.83730214773060
GPS BI-04
1 11141U 78112A 94040.31185017 -.00000004 00000-0 00000+0 0 8623
2 11141 64.5663 50.3425 0047704 26.0007 334.2798 1.92894722 1311
GPS BI-05
1 11690U 80011 A 94053.23006845 .00000014 00000-0 99999-4 0 7606
2 11690 064.8897 050.7509 0142815 198.4929 161.0180 02.00555595117248
GPS BI-06
1 11783U 80032A 94043.64590162 -.00000010 00000-0 10000-3 0 9543
2 11783 62.7218 282.4039 0209115 29.1795 332.0683 2.03456835101426
GOES 5
1 12472U 81049 A 94054.13472347 .00000000 00000-0 99999-4 0 7516
2 12472 006.5880 059.5491 0005880 330.0805 029.8917 01.00275470004622
Cosmos 1383
1 13301U 82066A 94044.50186910 .00000065 00000-0 59030-4 0 2648
2 13301 82.9269 40.4399 0029128 74.9561 285.4811 13.68051515580512
LandSat 4
1 13367U 82072A 94045.14458002 .00000199 00000-0 54183-4 0 4444
2 13367 98.1978 105.8035 0006158 280.7655 79.2850 14.57120828616146
IRAS
1 13777U 83004 A 94056.00418118 -.00000036 00000-0 00000+0 0 5701
2 13777 098.9709 249.2696 0013157 263.7700 096.2478 13.99192310235452
Cosmos 1447
1 13916U 83021A 94045.15461643 .00000015 00000-0 11915-7 0 3653
2 13916 82.9458 102.7072 0039051 14.0514 346.1719 13.74304741546437
TDRS 1
1 13969U 83026B 94041.00190701 -.00000053 00000-0 10000-4 0 2765
2 13969 7.4754 53.2288 0029305 134.6733 32.0581 0.99797156 12770
GOES 6
1 14050U 83041 A 94055.00219074 .00000000 00000-0 99999-4 0 1746
2 14050 005.3385 062.2724 0004415 313.1416 046.8221 01.00222910011655
OSCAR 10
1 14129U 83058 B 94051.71420822 .00000395 00000-0 99999-4 0 2625
2 14129 027.2097 340.7072 6035253 156.2883 250.5966 02.05880368052411
LandSat 5
1 14780U 84021A 94044.77076695 .00000145 00000-0 42133-4 0 306
2 14780 98.1796 106.8949 0003888 293.5025 66.5760 14.57127125529508
UoSat 2
1 14781U 84021B 94044.54889300 .00000363 00000-0 69607-4 0 6647
```

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S80/T
1 22078U 92052C 94045.42799786 -.00000037 00000-0 10000-3 0 3596
2 22078 66.0806 176.4196 0011233 320.9886 39.0312 12.86566391 71066
GPS BIIA-15
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1 22108U 92058A 94045.82396484 .00000002 00000-0 10000-3 0 3678
2 22108 54.4121 262.4758 0105969 134.5034 226.4116 2.00570854 10471
FREJA
1 22161U 92064 A 94054.96375329 .00000428 00000-0 19679-3 0 3723
2 22161 062.9997 219.0994 0780527 305.1784 047.9091 13.21728498066835
LAGEOS II
1 22195U 92070B 94043.79549654 -.00000009 00000-0 10000-3 0 2634
2 22195 52.6424 172.2993 0138578 63.1567 298.3090 6.47294107 30898
GPS BIIA-16
1 22231U 92079A 94042.52270274 .00000006 00000-0 10000-3 0 3720
2 22231 54.7425 204.0087 0036411 294.6480 64.9176 2.00562427 8984
GPS BIIA-17
1 22275U 92089 A 94047.65179126 .00000061 00000-0 99999-4 0 3784
2 22275 054.6659 201.3255 0051752 255.4813 103.9775 02.00559170008493
TDRS 5
1 22314U 93003 B 94049.91777529 .00000000 00000-0 99999-4 0 3724
2 22314 000.8379 073.2924 0002880 265.6697 094.3010 01.00276655004156
GPS BIIA-18
1 22446U 93007 A 94054.71035905 -.00000057 00000-0 99999-4 0 3669
2 22446 054.7320 321.9672 0072440 340.5835 019.1751 02.00578932007665
Glonass 59
1 22512U 93010 A 94055.03529617 .00000017 00000-0 99999-4 0 5208
2 22512 064.8990 112.7739 0009380 202.2543 157.7414 02.13102900007709
Glonass 60
1 22513U 93010 B 94054.50652984 .00000012 00000-0 99999-4 0 5377
2 22513 064.8966 112.8072 0007114 202.5018 157.5035 02.13103356007889
Glonass 61
1 22514U 93010 C 94054.74215209 .00000059 00000-0 99999-4 0 5167
2 22514 064.9044 112.7856 0013908 196.0391 163.9533 02.13102905007890
ASTRO-D
1 22521U 93011 A 94053.10849591 .00001253 00000-0 11126-3 0 2666
2 22521 031.1016 078.6434 0075987 048.5225 312.2378 14.93000489054889
UFO F1
1 22563U 93015 A 94054.50870640 .00000000 00000-0 99999-4 0 2596
2 22563 026.9496 301.5772 0009901 329.1224 030.8319 00.99249040007719
GPS BIIA-19
1 22581U 93017 A 94047.36825854 .00000009 00000-0 99999-4 0 2758
2 22581 055.0356 022.4778 0044349 031.8031 328.4973 02.00571850006543
ProgressM17
1 22588U 93019 A 94056.01000079 .00729104 00000-0 23055-3 0 5311
2 22588 051.6122 359.7664 0032506 306.0014 053.8710 16.24002759051921
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000+0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
GPS BIIA-20
1 22657U 93032 A 94052.98407660 -.00000085 00000-0 99999-4 0 2748
2 22657 055.0819 022.0470 0061753 206.0973 153.6239 02.00559865001972
GPS BIIA-21
1 22700U 93042 A 94054.44673791 -.00000001 00000-0 99999-4 0 2727
2 22700 054.5783 262.8697 0026243 320.0815 039.7591 02.00574243004804
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NOAA 13
1 22739U 93050 A 94055.03392710 .00000513 00000-0 28655-3 0 3350
2 22739 098.9328 359.9353 0010281 080.2067 280.0855 14.10883433028009
GPS BIIA-22
1 22779U 93054 A 94053.54100046 .00000147 00000-0 99999-4 0 2926
2 22779 054.8504 321.9287 0024939 230.0460 129.7681 02.00565891003541
Meteor 2-21
1 22782U 93055 A 94055.07216559 .00000032 00000-0 29846-4 0 2712
2 22782 082.5499 296.0785 0022246 181.0943 179.0671 13.83000890024457
UFO F2
1 22787U 93056A 94039.80432810 -.00000164 00000-0 10000-3 0 2595
2 22787 4.9483 323.2951 0108765 43.9126 134.3514 1.00291295 508
SPOT 3
1 22823U 93061 A 94052.73702378 -.00000033 00000-0 00000+0 0 2734
2 22823 098.7236 128.9180 0000713 131.4275 228.7508 14.20023459021103
STELLA
1 22824U 93061B 94045.21355068 -.00000018 00000-0 10571-4 0 2619
2 22824 98.6631 122.1489 0005580 202.3743 157.7190 14.27095054 20132
AO-27
1 22825U 93061C 94046.21545311 .00000058 00000-0 41460-4 0 2617
2 22825 98.6626 123.1936 0008062 202.2052 157.8775 14.27607193 20284
IO-26
1 22826U 93061D 94042.21058899 .00000053 00000-0 39268-4 0 2612
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
HEATHSAT
1 22827U 93061E 94042.20074436 .00000066 00000-0 44578-4 0 3230
2 22827 98.6630 119.2172 0008654 203.2830 156.7954 14.27813763 19716
PO-28
1 22829U 93061G 94045.75585944 .00000072 00000-0 46760-4 0 2541
2 22829 98.6608 122.7699 0009759 191.0097 169.0872 14.28003980 20229
KO-25
1 22830U 93061H 94045.75293537 .00000053 00000-0 38624-4 0 2647
2 22830 98.5674 121.3071 0011406 172.0390 188.0975 14.28033386 20227
GPS BIIA-23
1 22877U 93068 A 94053.09613179 .00000007 00000-0 99999-4 0 828
2 22877 055.1035 083.0554 0032320 281.9409 077.7304 02.00553805002429
METEOSAT 6
1 22912U 93073B 94046.35012321 -.00000089 00000-0 00000+0 0 693
2 22912 1.1763 268.6185 0001964 9.4574 342.8549 1.00271607 932
HST Array
1 22920U 90037 C 94054.86012958 .00018717 00000-0 16665-2 0 873
2 22920 028.4683 240.8839 0003958 135.4576 224.6813 14.95079759012508
Soyuz TM-18
1 22957U 94001 A 94055.38469298 .00012075 00000-0 14368-3 0 486
2 22957 051.6196 032.0721 0004696 000.7450 359.4210 15.60441575007381
Meteor 3-6
1 22969U 94003 A 94054.71398805 .00000004 00000-0 99999-4 0 283
2 22969 082.5641 136.3240 0014720 185.8499 174.2949 13.16718944003916
TUBSAT
1 22970U 94003 B 94052.73604704 .00000004 00000-0 99999-4 0 238
```

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2 22970 082.5650 137.7158 0016405 188.3996 171.7355 13.16826864003658
1994003C
1 22971U 94003 C 94054.71134177 -.00000893 00000-0 99999-4 0 227
2 22971 082.5650 136.3217 0016391 184.3214 175.8264 13.16836106003916
DSPSE
1 22973U 94004A 94034.53938549 .00306989 69601-5 12994+0 0 230
2 22973 66.8036 61.5120 9071498 202.2030 45.6648 0.46368841 1370
ProgressM21
1 22975U 94005A 94056.02508724 .00001097 00000-0 19313-4 0 387
2 22975 51.6169 28.8511 0004584 15.4369 344.6151 15.60444930 4373
OREX
1 22978U 94007A 94034.91970139 .00000150 00000-0 00000+0 0 16
2 22978 30.5073 159.4204 0007002 226.1375 134.0418 15.37491022 03
VEP
1 22979U 94007 B 94052.60613680 .00000000 00000-0 00000+0 0 180
2 22979 028.6544 154.5327 7225966 171.0119 217.7863 02.24300690000408
Raduga 31
1 22981U 94008A 94055.86678269 .00000105 00000-0 00000+0 0 264
2 22981 1.4753 274.8752 0003023 230.0180 10.6926 1.00294396 201
1994008D
1 22984U 94008 D 94049.39777628 .00000000 00000-0 99999-4 0 69
2 22984 001.5160 274.8881 0019882 303.2186 056.5926 00.97969529000132
1994008E
1 22985U 94008 E 94051.68616056 .00001519 00000-0 87097-3 0 119
2 22985 047.3560 271.7892 7309318 003.9928 359.5946 02.22711959000358
1994008F
1 22986U 94008 F 94052.61052709 .00000535 00000-0 64891-3 0 117
2 22986 047.4637 271.6580 7292409 004.1271 359.5760 02.22331341000351
1994004C
1 22987U 94004 C 94051.61071177 .00000000 00000-0 00000+0 0 62
2 22987 066.0359 060.6336 9037765 202.5188 045.4592 00.46843407000135
ODERACS A
1 22990U 94006 B 94055.45683643 .00069611 00000-0 43235-3 0 98
2 22990 056.9911 121.6225 0020031 304.9234 055.0748 15.76112616002327
ODERACS B
1 22991U 94006 C 94055.46098843 .00070267 00000-0 44627-3 0 97
2 22991 056.9849 121.6435 0017463 303.2753 056.7436 15.75679267002336
ODERACS E
1 22994U 94006 F 94055.46975300 .00040420 00000-0 27155-3 0 110
2 22994 056.9836 121.7009 0016394 311.6158 048.4294 15.74421356002329
ODERACS F
1 22995U 94006 G 94055.47066377 .00041811 00000-0 28198-3 0 110
2 22995 056.9884 121.7057 0016044 310.5815 049.4645 15.74340528002328
SJ 4
1 22996U 94010 A 94053.72749815 .00003979 00000-0 41543-3 0 29
2 22996 028.5444 251.1027 7317325 188.2512 144.1565 02.25755395000144
1994010B
1 22997U 94010 B 94054.60520432 .00014002 00000-0 20830-2 0 57
2 22997 027.7000 250.7680 7310050 188.6826 142.4233 02.25964532000153
BREMSAT
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1 22998U 94006 H 94049.75513521 .00029285 00000-0 20129-3 0 145
2 22998 056.9933 147.4695 0015394 293.3994 066.6268 15.73917311001276
Cosmos 2268
1 22999U 94011 A 94055.09789854 .00000000 00000-0 99999-4 0 168
2 22999 082.5768 295.1374 0008771 251.3911 108.6685 12.60998065001488
Cosmos 2269
1 23000U 94011 B 94052.07774509 -.00000164 00000-0 99999-4 0 69
2 23000 082.5683 297.0399 0007010 286.4409 073.6364 12.61749401001105
Cosmos 2270
1 23001U 94011 C 94048.74363002 .00000000 00000-0 99999-4 0 126
2 23001 082.5731 299.1682 0009508 328.8386 031.2658 12.62639743000683
Cosmos 2271
1 23002U 94011 D 94050.08749791 -.00000184 00000-0 99999-4 0 56
2 23002 082.5653 298.2968 0009795 353.8943 006.2481 12.63243713000842
Cosmos 2272
1 23003U 94011 E 94052.06139672 -.00000055 00000-0 99999-4 0 44
2 23003 082.5723 297.0309 0013721 358.7945 001.3565 12.64137974001096
Cosmos 2273
1 23004U 94011 F 94049.06063319 -.00000268 00000-0 99999-4 0 142
2 23004 082.5742 298.9671 0006158 341.7081 018.4241 12.62629914003538
1994011G
1 23005U 94011 G 94054.03663295 -.00000024 00000-0 99999-4 0 55
2 23005 082.5787 295.8869 0040830 221.9237 137.9174 12.55112617001337
1994010C
1 23009U 94010 C 94054.59563291 .00026735 00000-0 28358-2 0 59
2 23009 028.5599 250.7644 7314064 188.8049 141.8891 02.26131786000148
1994012A
1 23010U 94012 A 94055.20835035 .00000000 00000-0 99999-4 0 171
2 23010 001.4538 275.2060 0032350 119.0645 241.2604 00.98757888000065
1994012D
1 23013U 94012D 94054.96897887 -.00000040 00000-0 00000+0 0 28
2 23013 1.5053 276.2318 0026389 349.9258 282.9647 0.98106621 47
1994012E
1 23014U 94012 E 94051.62894494 .00001204 00000-0 58612-3 0 39
2 23014 047.3751 275.6215 7313129 000.2632 359.9903 02.22716123000055
1994012F
1 23015U 94012 F 94049.83335006 .00000123 00000-0 17036-3 0 11
2 23015 047.4240 276.1243 7293609 359.9212 000.0266 02.21706726000025
1994013A
1 23016U 94013 A 94054.28296169 .00000000 00000-0 99999-4 0 62
2 23016 000.4906 147.1912 0305175 176.2244 183.9767 00.99582526000057
1994013B
1 23017U 94013 B 94055.90277323 .01976711 00000-0 55076-3 0 119
2 23017 026.5490 298.1374 1812201 197.6440 155.1860 12.22336440000600
1994013C
1 23018U 94013 C 94053.02260834 .00000000 00000-0 99999-4 0 32
2 23018 025.6274 320.2672 6494643 000.1582 359.9920 02.02378481000042
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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299. TO: Mr. Bill Freeman

Newsgroup: rec.radio.amateur.space
Date: 1994-02-27 04:54:47 UTC
From: bergst@birch.ee.vt.edu
Message-ID: <2kp92n$l4k@solaris.cc.vt.edu>
Source record: 27952

Mail to you system bounced. (could be our network)

Thank you for the information. It was very helpful.

Rob Bergstrom
Virginia Tech

300. Need COSPAS/SARSAT System information.

Newsgroup: rec.radio.amateur.space
Date: 1994-02-27 06:44:44 UTC
From: postmaster@asarin.ORG.AR
Message-ID: <gate.0gmeic1w165w@asarin.org.ar>
Source record: 27953

Hi!
I'm developing an Emergency Beacon for Positioning and Rescue of ship and aircraft use, and I need some information about the COSPAS/SARSAT satellite system.

Basically, I want to know what information must be sent, how it has to be encoded on each of the three frequencies (121.5 MHz, 243 MHz and 406 MHz).

If you have ANY of this information (or part of it), please send it to me (or at least let me know) via the following paths:

Packet radio: lu7akc @ lu7akc.#col.cf.arg.soam
Internet: postmaster@asarin.org.ar

Thankyou in advance!

73's de Ed Sweet.

301. [Q] amateur satellite performance record

Newsgroup: rec.radio.amateur.space
Date: 1994-02-27 16:24:29 UTC
From: wsears@lpl.arizona.edu
Message-ID: <WSEARS.94Feb27092430@eludium.lpl.arizona.edu>
Source record: 27954

Greetings,

I'm interested in up-to-date preformace records for the amateur satellites.
What I mean by that is things like:
How many launched vs. how many still in service.
How many launched vs. how many survived passed their designed life,
and what failure modes have been experienced.

The idea here is to be able to show people how well the amateur satellite
service has done, and enforce the arguments for small space craft in
the space science community. Any help would be welcome.

73
de KG7IO

William Sears | 'I reserve the right to ask irrelevant
Lunar and Planetary Lab | questions, even impudent ones.
wsears@lpl.arizona.edu | You, of course, don't have to answer.'"
--
William Sears | 'I reserve the right to ask irrelevant
Lunar and Planetary Lab | questions, even impudent ones.
wsears@lpl.arizona.edu | You, of course, don't have to answer.'"

302. ANS-057 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-02-27 16:46:01 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-057.01.1994@ampr.org>
Source record: 27955
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT
PRELIMINARY RS-15 INFORMATION

HR AMSAT NEWS SERVICE BULLETIN 057.01 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 26, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-057.01

Preliminary RS-15 Data Provided by LW2DTZ

Gustavo Carpignano (LW2DTZ) provides this summary of information regarding RS-15 which he has obtained from several Russians who are participating in this project.

According to these sources, the official "presentation" of RS-15 to the Russian Space Agency has been delayed until 20-MAR-94. The launch date has shifted its position for launch since the Cosmodrome is not quite ready for it. It is reported that RS-15 will launched by a Rokot vehicle, which is a refurbished SS-19 with the addition of a third stage.

Some data regarding equipment and orbital parameters are:

Uplink: 145.857 - 145.897 MHz
Downlink: 29.351 - 29.397 MHz
Beacon #1 29.398 MHz Power 0.4 or 1.2 W
Beacon #2 29.353 MHz Power same as Beacon #1
Antenna 1/4 wave
Height 2,300 KM
Inclination 67 degrees

Much of this information has also been confirmed by Vern Riportella (WA2LQQ) by his sources in Russia.

[The AMSAT News Service (ANS) wishes to thank Gustavo Carpignano (LW2DTZ) of AMSAT-LU and Vern Riportella (WA2LQQ) for the information used in preparing this bulletin.]

/EX
SB SAT
G0/K8KA RECEIVES HIS PHD

HR AMSAT NEWS SERVICE BULLETIN 057.02 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 26, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-057.02

G0/K8KA Receives Doctorial Degree From University of Surrey

It is with very great pleasure that the amateur space community congratulates Jeff Ward (K8KA/G0SUL) on the award of his PhD thesis after a "viva voce" examination Thursday, 24-FEB-94 at the University of Surrey in England. Dr. Martin Sweeting (G3YJO) announced that Jeff's thesis, entitled "The Design, Implementation and In-Orbit Demonstration of a Store & Forward Digital Communication System for Low Earth Orbit Satellites", was accepted by the University of Surrey Examiners unanimously without need for any corrections. G3YJO notes that such unconditional acceptance is a rare occurrence.

The amateur space community joins G3YJO in saying, "Well done Dr. Ward"!

Bill Tynan W3XO, AMSAT-NA President says that he is especially pleased with Jeff's accomplishment because they represent yet another example of the role that amateur radio can play in education at all levels.

[The AMSAT News Service (ANS) would like to thank Martin Sweeting (G3YJO) for the information used in this bulletin.]

/EX
SB SAT
BREMSAT TELEMETRY REPORTS NEEDED

HR AMSAT NEWS SERVICE BULLETIN 057.03 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 26, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-057.03

BREMSAT Telemetry Reports Requestedle For AO-13

The German BREMSAT satellite was deployed on the STS-60 shuttle mission in early February as a "getaway special." It is a scientific satellite carrying a number of experiments including measurements of atomic oxygen, micrometeor/dust impacts, etc. BREMSAT is in a low orbit and is predicted to enjoy a lifespan of only 45 days.

Oliver Amend (DG6BCE) has asked radio amateurs for assistance in monitoring BREMSAT's telemetry during reentry. Oliver is a member of the German "Technical Youth Leisure Education Association." They hope to compile the reentry telemetry from several groundstations located along the reentry path. However, the path is difficult to predict and he is looking for amateurs -- particularly those in the southern hemisphere -- who can act as monitoring stations to fill any gaps in their coverage.

BREMSAT transmits 9600 bps telemetry on 137.8 MHz. The data can be received with a simple bi-phase decoder. Construction details are available directly from DG6BCE.

If you are interested in monitoring the final moments of BREMSAT, or if you know anyone who is, please contact Oliver Amend at the following address:

Oliver Amend
Durerstr. 56
D-28844 Weyhe-Leeste
Germany

At this late date, it may be best to send a fax message to him if you have the capability. Address the fax cover sheet to:

Oliver Amend
c/o DST
fax number: 49-421-40-46-60

/EX
SB SAT
AO-13 OPERATIONS NET

HR AMSAT NEWS SERVICE BULLETIN 057.04 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 26, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-057.04

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

05-Mar-94 2200 B 077 W9ODI VE2LVC
13-Mar-94 0130 B 075 VE2LVC W9ODI
19-Mar-94 1730 B 073 W5IU WA5ZIB
26-Mar-94 2130 B 084 WA5ZIB W5IU

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

AO-13 ZRO Tests For March 1994

The following schedule of Mode "B" tests were chosen for convenient operating times and favorable squint angles. The tests can be heard on 145.840 MHz. Andy McAlister (WA5ZIB) will conduct all the tests. Mode "JL" tests will no longer occur due to the failure of AO-13's 70CM transmitter.

Day Date (UTC) Time Areas covered

Saturday Mar. 19, 1994 1930 UTC NA, SA, Europe, Africa
Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC". Any changes will be announced as soon as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy MacAllister (WA5ZIB), AMSAT V.P. User Operations, 14714 Knights Way

Drive, Houston, TX 77083-5640. A report will be returned verifying the
level of accurate reception. An S.A.S.E. is appreciated but not required.

/EX
SB SAT
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 057.05 FROM AMSAT HQ
SILVER SPRING, MD FEBUARY 26, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-057.05

Weekly OSCAR Status Reports: 26-FEB-94

AO-13: Current Transponder Operating Schedule:
L QST
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
23-FEB-94 8:05 -TO- 02-MAR-94 6:40 UTC
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

IO-26: The BBS is up and running (1200 baud) and seeing a lot of use.
[WH6I]

KO-23: Up and running. [WH6I]

KO-25: The BBS is running. After the first "bunch" of images, there have
been no new ones. The format for the smaller image files will
apparently not be made available to amateurs. [WH6I]

RS-12: Last week ZS6AOP asked what the preferred mode of operation is over
Europe and the US? AL7MK reports that while he lived in Alaska,
about 75% of his QSOs on RS-12 were accomplished using CW because,
as he explains, "it worked better on marginal passes." Today AL7MK
lives in CT. His satellite operations only include MIR using his
H/T with a 30 watt amplifier at the moment until he brings his HF
gear out of storage. [AL7MK @ W1NRG.CT]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

303. Portable Oscar 13 Station?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-27 21:25:56 UTC
From: zlau@arrl.org
Message-ID: <1994Feb27.212556.8284@arrl.org>
Source record: 27956

I've not been able to find much on portable Oscar 13
stations--ones that work well with little antennas
and low power. The QRP publications seem to focus
on the low earth orbit satellites.

I tried Mode S, 6 watts to a 5.5 ft boom 436 MHz
yagi and a 2 ft. dish with a 2.4 GHz feed, but
only made 6 contacts in 3 hours (1 hr/day).

Problem was, several stations had trouble hearing
my signal, even though it sounded fine to me.
I could sometimes hear myself clearly running
6 dB less power (1.5 watts).

Should I try Mode B or work on my 436 antenna?

I prefer small antennas I can stick in my car
without taking apart. Makes a big difference
when the weather changes for the worse....

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

304. GPS information/schematics

Newsgroup: rec.radio.amateur.space
Date: 1994-02-28 00:43:13 UTC
From: "Keith A. Randino" <p00926@psilink.com>
Message-ID: <2971474522.0.p00926@psilink.com>
Source record: 27957

Hello netters,
I'm looking for information/schematics on how to make a GPS reciever.
It must be fairly simple to make and cost around $10.00 to build. :-)
Seriously though, I'd like it to be resonable in price. I want to build
one to use for making maps for orienteering and also to track myself
on excursions into the deep woods. There is nothing I can't handle
in the digital world but the world of high frequency analog is kind
of a mystery. Any help would be greatly appreciated.

Keith

|Keith A. Randino | "Those willing to trade their rights for |
|E-Mail : p00926@psi.com | security will have neither." Ben Franklin |
---

305. APT-Satellites: Report FEB 27, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-02-28 08:11:22 UTC
From: peter.henne@gmd.de
Message-ID: <1994Feb28.081122.10126@gmd.de>
Source record: 27959
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, Feb 27, 1994

NOAA-9: APT 137.62 *OFF*
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.40 On (weak)

NOAA-9 APT is off due to VHF-conflict with NOAA-11.
Meteor 2-21 APT-frequency changed from 137.85 to
137.40 MHz. No other Meteor was active, but due to
last FANAS (Mike Kenny, wxsat-mail-list) Meteor 3-5
will possibly become active soon.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

306. Re: Portable Oscar 13 Station?

Newsgroup: rec.radio.amateur.space
Date: 1994-02-28 16:37:23 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Feb28.163723.17393@ke4zv.atl.ga.us>
Source record: 27960

In article <1994Feb27.212556.8284@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
>
>I tried Mode S, 6 watts to a 5.5 ft boom 436 MHz
>yagi and a 2 ft. dish with a 2.4 GHz feed, but
>only made 6 contacts in 3 hours (1 hr/day).
>
>Problem was, several stations had trouble hearing
>my signal, even though it sounded fine to me.
>I could sometimes hear myself clearly running
>6 dB less power (1.5 watts).

Hey, that's good. The problem's not on your end. The
problem is that most mode S stations are deaf, most
mode B too if the truth be known.

>Should I try Mode B or work on my 436 antenna?
>
>I prefer small antennas I can stick in my car
>without taking apart. Makes a big difference
>when the weather changes for the worse....

The sad fact is that most Oscar users will have
trouble copying you if your signal is much weaker
than the beacon. If you can muster about 100 watts
ERP uplink on 436, a lot more stations will respond
to you. Also there's a lot more activity on mode B,
and some of those stations have impressive receiving
setups (ZRO 8 or better) and will have little trouble
copying your low power uplink.

I had a nice long SSB chat with a group uplinking to
Oscar 10 from Antarctia who were using only 5 watts
and a short beam. (This was before AO10 went sour.)
They'd been calling for days with no response. After I
built a pileup for them, they made a bunch of contacts.
Of course I was using four stacked 424B Long Boomers
with a good mast mounted preamp at the time and they
came booming in on my receiver. Most other stations
had been tuning right past them without noticing they
were there.

When I operate portable, I use a short helix for uplink,
and a 100 watt Mirage amp. I can make enough uplink power
to be heard clearly by most stations, and can turn down
the wick with the better stations. The problem on mode
B is receiving with a small antenna. It limits you to

working only the stronger stations. Your mode S receive
setup sounds really hot. I can't claim that kind of
performance, and I have a 4 foot dish at the home
station. (I obviously need a better LNA.)

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

307. Re: GPS information

Newsgroup: rec.radio.amateur.space
Date: 1994-02-28 20:18:08 UTC
From: beale@leland.Stanford.EDU
Message-ID: <2ktji0$p8m@nntp2.Stanford.EDU>
Source record: 28061

Keith: (sorry, email to you bounced)

Concerning GPS: not what you want to hear perhaps, but I suspect that a nearly-finished GPS receiver module is the cheapest way to go. Now that the radio front-end has been pretty highly-integrated by high volume manufacturers, do-it yourself GHz spread-spectrum recievers don't make so much sense.

Do you get QEX (the ARRL Experimenter's Exchange, available from ARRL) ? If not, you probably should! The February 1994 issue has: "Interfacing GPS or LORAN Devices to Packet Radio" on p. 9-14. They discuss the Magellan OEM 5000 board (12V at 250 mA, 3.5x7 inch circuit board) which gives you RS-232 output of LAT/LON, altitude, and time in a standard (NMEA) format. It was $445 and needs an external antenna ($60 passive, $130 active). They say that Magellan will be coming out with a smaller GPS card for $295 in May, with binary output rather than formatted ASCII.

Trimble Navigation (Sunnyvale, CA) also makes some OEM GPS modules, although I am only aware of packaged units for use in cars/trucks, and I haven't checked on the pricing.

I believe that a GPS reciever is a challenging project even for an expert in both microwave and digital circuits, with access to a lot of test equipment and a rather large supply of free time.
If your time is even differentially more valuable than exactly zero, I think buying is the way to go!

Best,
John Beale
n8juf

308. Re: GPS information

Newsgroup: rec.radio.amateur.space
Date: 1994-02-28 22:26:06 UTC
From: waf@sunfish.zk3.dec.com
Message-ID: <WAF.94Feb28172606@sunfish.zk3.dec.com>
Source record: 28062

Keith,

My E-mail bounced as well. E-mail or post a good address if
you want a long message covering where to look for handheld units
whose prices I don't think that you can beat with straight home brew.
They are probably more expensive than you could get away with using
the boards that John suggests, but as finished rugged units including
display, antenna, batteries and charger, they may still have apeal.

The other thing covered that makes the message longer than I
want to post is a copy of an old reply to another poster in which I
try to remember enough about how GPS works in detail, with the object
of convincing the reader that there are better home brew projects upon
which to spend one's time. It could serve to try to convince you that
waiting for the $295 Magellan board is the way to go.

Bill Freeman, KE1G, waf@zk3.dec.com

309. Satellite FAQ answers (long)

Newsgroup: rec.radio.amateur.space
Date: 1994-02-28 23:36:55 UTC
From: stephen@hpdmlge.boi.hp.com
Message-ID: <CLyK9J.Gu6@boi.hp.com>
Source record: 28063

The following text was compiled from the following sources:

* "How to use the EZSATS pas tables by N9LTD" reprinted without permission. Full text, tables, and lots of other useful information can be obtained by sending a SASE to David Mullenix N9LTD, 2052 Brentwood Pky, Madison, WI 53704

* "Amateur Radio Satellite Frequencies" This file can be obtained from the ARRL e-mail server. For information on the server, send an e-mail message to info-serv@arrl.org with 'HELP' in body of message.

* "Summary - Getting onto the Hamsats" This was an article posted to rec.radio.amateur.misc newsgroup by Stephan Greene (sgreene@access.digex.com) on 20 Mar 1992. The article is also available via anon ftp from ftp.cs.buffalo.edu or Australian mirror at grivel.une.edu.au as file pub/hamradio/ham_sat_sum.

* "An Amatuer Satellite Operation Upgrade Path" from the AMSAT Journal, September/October 1993, pp. 24-26.

FORWARD:

Having recently started to get into Satellites, I asked MANY people what it took to get started and what to do. I found few people who could offer all the information necessary to start. I have attempted to compile this information for future newbies. If I have missed something, please ask and I will attempt to add it to the collection.

Also, if you really want to get serious about satellites, I would STRONGLY recommend joining AMSAT to help promote the satellite hobby. AMSAT is a volunteer organization that works for the interests of amateur satellites. Dues are only US$30 per year and you will receive a subscription to "The AMSAT Journal". For US$80, you will receive first year dues and a copy of Instant Track computer tracking software which is a top-notch program. Instant Track was donated to AMSAT by its author and its sales account for a considerable portion of AMSAT's income. AMSAT-NA, 850 Sligo Avenue, Silver Spring, MD 20910-4703. (301) 589-6062. Credit cards welcome. NOTE: I am in no way connected with AMSAT-NA, other than I have found their publications quite useful.

MODES:

The combination of uplink freq, downlink freq, and transmission mode are all lumped together into standardized satellite MODES. Here is a list of common satellite modes used by satellites covered by this article:

A - This mode requires a 2 meter SSB/CW trasmitter and a 10 meter SSB/CW receiver and supports CW and voice.

B - This mode requires a 70 cm SSB/CW transmitter and a 2 meter SSB/CW receiver and supports CW and voice. Some satellites also support RTTY and SSTV in this mode.

K - This mode requires a 15 meter SSB/CW transmitter and a 10 meter SSB/CW receiver and supports CW and voice. This mode is unique in that it can be done with a simple HF rig.

JA- This mode stands for J Analog and requires a 2 meter SSB/CW transmitter and a 70 cm SSB/CW receiver and supports CW, voice.

JD- This mode stands for J Digital and requires a 2 meter FM transmitter and and a 70 cm SSB/CW receiver and supports packet.

S - This mode requires a 70 cm SSB/CW transmitter and a 2.4 GHz SSB/CW receiver and supports CW and voice. Many people use a 2.4 GHz to 2 meter converter with a 2 meter SSB/CW receiver instead of buying a 2.4 GHz SSB/CW receiver.

Also, satellites have 3 basic types of retransmissions: beacon, transponder, and repeater.

Beacon - Most satellites have a fixed Morse beacon at the lower end of the satellites band-pass transponder. This is useful to detect when the satellite has crossed the horizon and is in range for operation. It can also be used to determine dopler shifts.

Transponder - A transponder is a band-pass repeater. It accepts a range of frequencies on the input and retransmits the entire range on the output. All offsets withing that range are preserved. NOTE: since the satellite is transmitting many signals at the same time, it is dividing its output power amongst all of these signals. If someone transmits a very powerful signal into the satellite, it will spend most of its power retransmitting that signal and all of the other signals will drop in power. This is NOT a way to earn friends and people who overpower the satellites input are called "alligators" and are not very popular.

Repeater - This closely resembles a land-based repeater. It listens for signals on one frequency and retransmits it on another frequency. All satellite repeaters (and transponders) are full duplex, meaning you can (and should) listen to you signal on the downlink (with headphones) while you are transmitting.

SATELLITES:

Some satellites are easier to work than others. The satellites that follow can be operated fairly easily and are referred to by some as the Easy Sats. What follows is a breif description of each satellite. A summary list of operating frequencies is included later.

Mir

Mir (promounced "mere" - "Peace" in Russian) is the Russian Space Station. It's been in orbit since 1986. All recent Russian Cosmonauts have been hams and have callsigns with "MIR" in them, such as U2MIR. Mir has 2-meter

equipment on board and they operate packet and voice on 145.55 MHz. (This is the same freq as the Space Shuttles.) The cosmonauts also have a digital voice recorder which can repeatedly transmit voice announcements.

The best way to get a QSL card from Mir is to connect to their TNC's mailbox, R0MIR-2, (That's R Zero MIR) leave a message AND GET A MESSAGE NUMBER. You must have the message number to qualify for a QSL. The TNC is often busy because amatuers forget to disconnect before Mir goes under their horizon. In a case like this, try connecting to yourself or a friend VIA R0MIR. And if you hear a heavily accented voice calling CQ, by all means say hello!

70 cm and ATV gear is being prepared for future flights!

QSL Address:
Sergei Samburov (RV3DR)
Prospect Kosmonavtov. d.36, kw.96
Kaliningrad City, MOSCOW 141070, RUSSIA.

Sergei can also be reached via packet radio as RV3DR @ RK3KP.#MSK.RUS.EU

A special note on caculating Mir's orbit: Mir is big and it's in a low orbit. This means that there's a lot of atmospheric drag and it has to fire its rockets every month or two to boost itself back up or it would have re-entered and burned up long ago. Unfortunately, whenever this happens, it throws off all pass predictions. When this happens, Mir will arrive LATER than predicted, so if you tune to 145.55 and nothing happens at the predicted time, keep waiting, it may be along in 10-30 minutes.

SEEING MIR: Mir is also the only EZSAT that can bee seen. Mir is very big, about the size of a semi-trailer, and when it comes over just after sunset or just before sunrise, you can often see it go by. This is because Mir will still be in sunlight whil you're in the earth's shadow. In these cases, Mir looks like a very bright star gliding acress the sky. It's a beautiful sight and well worth looking for. It's best to use a tracking program set to VISUAL to find visible passes. The best such programs will even draw you a star map and show you Mir's path across it. Don't forget to tune to 145.55 when you see it. Also, don't forget to get on the local repeater and tell people when you spot it so that others can share in the fun.

OSCAR-21, RS-10/11, RS-12/13

These three satellites are all in 600 mile high polar orbits, which carry them over the US six to eight times a day for 10-18 minutes at a time. They all have orbital periods of about 95 minutes and we typically get two sets of three or four passes spaced 95 minutes apart. The two sets of passes are spaced 12 hours apart and their passes come a little earlier each day because their orbits don't take quite exacly 95 minutes.

These satellites all have a coverage circle about 4000 miles in diameter, so when they're about the horizon, you can use them to work hams anywhere in the conteinental US, Canada, Alaska, Mexico, Central America, South America down to the Equator, the Caribbean, Greenland, Iceland and parts of Scandinavia. Eastern hams can work Europe and the West can work Hawaii.

All of these satellites are in boxes that are bolted to larger Russian satellites and draw their power from the large satellite's solar cells. They are VERY easy to hear and fairly simple to work.

OSCAR-21

My favorite satellite. This is a German/Russian radio that uses a Digital Signal Processor (DSP) chip and it is Flexible with a capital "F"! It was launched in January, 1990 configured as a linear translator which received a band of 70 cm CW and SSB signals and relayed them on 2 meters. The bird was, to put it mildly, under-utilized. Then in 1992 the DSP chip was reprogrammed in orbit into a cross band FM repeater! If you've been wondering if DSP is as powerful as you've heard, now you know! In the past year, it's telemetry has been re-programmed from an obscure format to standard 1200 baud packet. WEFAX pictures (which are uploaded by teh ground controllers) were added in December 1993. (This is the same format used by many weather sats and short wave weather stations.)

OSCAR-21 has an input frequency of 435.016 MHz, but 435.015 works just fine. It's output frequency is 145.987 MHz, but 145.985 or 145.990 will recieve it quite well. It has a strong transmitter and a ground plane antenna and most HTs have no trouble picking its signals up when it passes over. Mobiles and base stations with omni antennas will receive it full quieting. You can get into this bird with 20 watts and a six element beam antenna. I mount my beam on a photo tripod next to my car and run coax to my dual band mobile. You have to point the beam accurately, so I take a list of altitude and azimuth bearing generated by simple tracking software out with me and re-point the beam once a minute. In one summer, I worked the east and west coasts, several Canadians, Texas and Guantanamo Bay, Cuba before fall's cold weather drove me indoors.

Some OSCAR-21 tips: you can hardly get a word in edgewise during "prime time" opening passes. Try the late night passes instead, they're much less crowded. OSCAR-21's transmit and recieve polarity rotate constantly during a pass. Mount your beam so you can easily rotate it for the best signal. Remember, all these ham sats are full duplex, so you can and should monitor your signal on the downlink. (Use headphones.) Turn the beam for minimum noise. You'll probably have to modify your dual band rig to get it to transmit on 435.015. BE CAREFUL beacuse FM is generally NOT appreciated below 440 MHz. Also, the mod may allow you to transmit out of band, which is a real no-no.

OSCAR-21 is also known as RS-14, AO-21 and Rudak-2. It's bolted to a satellite called INFORMATOR-1, which is often abbreviated INFORMTR-1. It's NORAD ID number is 21087. Be careful, the rocket booster that launched the satellite is still up there and it's named INFORMTR-1 R/B in some element sets. Your tracking program may find it instead of the satellite if you're not careful.

RS-10/11

This is probably the easiest satellite to work of them all. It has an incredibly sensitive receiver that can pick up the faintest two meter signal

and relay it on ten meters. There are documented examples of people having QSOs on RS-10/11 by clicking Morse on HTs with rubber duck antennas! I guarantee you that your HT can put a useable signal into RS-10/11, I've done it myself. WARNING: if you try this, disable the microphone so you don't transmit any FM sidebands and turn your CTCSS (PL) OFF!

RS-10/11 (Radio Sputnik) is for CW and SSB signals, so an all mode 2 meter rig is ideal for transmitting to this bird. The input bandpass is from 145.860 - 145.900 and the output freqs are from 29.360 - 29.400 MHz. There is also a morse beacon at 29.357 MHz.

RS-12/13

A cousin to RS-10/11, RS-12/13 is also a 40 KHz wide linear transponder. However, this bird is unique because its input frequencies are in the fifteen meter band! This is also the only ham sat in the sky that requires more than a code free technician license to work it, because its input band is from 21.210 - 21.250 MHz. This straddles the Advanced and Extra portions of the 15 meter band. Its output freqs are from 29.410 - 29.450 MHz. Because of skip, this satellite can often be heard and worked when it's below the horizon! At least one person has earned DXCC on this satellite! RS-12/13 is bolted to the ?????? ???? satellite and its NORAD ID is 21089.

DOVE

DOVE is a transmit-only hamsat. It has no user accessible receiver. Built in Argentina, DOVE was launched in 1990 as a good will satellite. It was originally intened to transmit digitized voice messages that could be picked up by students with simple receivers. Unfortunately, the digital voice hardware and software has been a constant source of problems since launch. Atempts to get DOVE to works properly are proceeding as this is written, so the best bet is to tune your 2-meter rig or scanner to 145.825 MHz and see what the bird is up to currently. Be ready for Morse, standard 1200 baud packet or (with luck) digitized voice messages. The signals are strong enough so that an HT with a rubber duck will hear it when it's overhead, although ground plane antennas will give better coverage when the bird is near the horizon.

ANTENNAS:

For AO-13, the consensus is get to get KLMs, Telex/Hy-Gains, or roll-your own, Nobody liked the Cushcraft satellite antennas - they appear to have problems in wet weather. Bigger is also better, if you have the space. Several people mentioned the KLM 22C and 40CX pair as excellent performers (again - you need the room for those long booms!) KE4ZV stated his pair of KLMs (the big ones!) lets him work AO-13 with 3 to 30 watts (hardline feed and rigorous attention to routing the feedlines and cables properly to maintain the antenna patterns helps, too.). Others mentioned the KLM 14C/18C pair as good performers - but you need more power on the uplink.

Telex/Hy-Gain antennas were recommended by several people as a less expensive alternative to KLMs that work almost as well. There's also M2 (started by an engineer from KLM). While no one who responded uses them,

the information I received from a call to their factory in California suggests they are comparable to slightly better than the KLMs in performance, and about the same in cost. Dave, WB6LFC, said homebrewing antennas is also feasible - it takes work, but attention to detail results in top-notch performance for very little money. Finally, Ross, VE6PDQ, reported good results using a pair of Cushcraft 215WBs on receive.

Problems encountered with AO-13 antennas include routing cables and feedlines off the back of the antennas (to preserve antenna patterns), use of fiberglass cross booms, mounting preamps as close to the feedpoint as possible, and long antenna booms drooping. (Gary, KE4ZV, recommends using a rope to brace the boom or stiffening booms and fiberglass masts internally with foam-in-a-can insulation.)

On antenna rotators, it appears the Alliance UD-100 is no longer made, though it should still show up at hamfests. People with long-boom antennas report the Alliance rotator is too weak to move a big array anyway, and recommended Yaesu's elevation-only rotator or their Model 5400 azimuth-elevation unit.

Antennas for the low-altitude satellites appear to be much less critical. J-poles were most frequently mentioned (the design from the AMSAT Journal?), but dipoles, ground-planes, and yagis are also in use. Several people work RS-10 quite well with antennas in the attic. Best results are with steerable antennas, but the high operator workload during a pass (unless the satellite is just grazing your access circle) almost demands computer control of the rotators.

PREAMPS:

You need a preamp for AO-13. (I can hear the downlink after a fashion on a Ringo fed with cheap coax and a 10 dB preamp in the shack, but it's not communications quality reception!) Only two people mentioned a specific brand name (Advanced Receiver Research and the unit included with the Ten-Tec 2510), so I assume almost any GAsFET preamp in the 20dB gain class is adequate. THE PREAMP MUST (almost always) BE MOUNTED AT THE ANTENNA (check the discussion in Chapter 9 of the Satellite Experimenter's Handbook and you'll see why!). KE4ZV recommends mounting the preamp AT the antenna feedpoint, if your elevation rotator can handle the unbalanced load.

While no one mentioned it (maybe it's obvious), if the antenna is used to transmit (say Mode J) as well as receive (on Mode B, for example), the preamp MUST either include RF-sensed switching, or be switched out of the line before you transmit. TRANSMITTING INTO AN UNPROTECTED PREAMP WILL DESTROY IT INSTANTLY!

Preamps also seem to help on RS-10 (especially with older HF rigs) and on the Pacsats. It seems to be a case of "try it, and get a preamp if it looks like it would help").

RIGS:

Three radios were mentioned by name - Yaesu FT736 (and it's predecessor, the 726 with satellite module), Kenwood TR751 (a mobile-capable 2 meter multimode), and Ten-Tec's 2510. The Ten-Tec unit is out of production. The few units left are selling for about $300-350. I'm sure other multi-mode radios, and setups with converters and transverters work well, too - it's just that no one mentioned any by name.

Power output required is a function of the satellite, your antennas, and how badly you want to communicate. [QRP on the satellites is just like QRP on HF - you need good antennas and feedline, you have to pick optimal passes, and skilled operators at both ends are needed. Given the apparent "calmer" operating style on AO-13, QRP is probably easier there than on 20 meters!]

Anyway -about power for AO-13. 3-30 watts will work if you have top-notch antennas (KE4ZV). KC7IT uses 50-100 watts (Ten Tec 2510, Mirage D1010 amplifier, KLM 14C/18C fed with 50 feet of 9913). Both KE4ZV and KC7IT use Mirage D1010 amplifiers on 70 cm when they need a little extra power. For an "optimum station", WA5ZIB recommends 60 watts on 70 cm and 80 watts on 2 meters for AO-13, assuming good antennas (Telex/Hy-Gain or better) and feedlines, and 20 watts to a 5' dish for Mode L. Andy emphasized that you can get by and have lots of fun with much less!

For Mode A, WA5ZIB said 6 watts to the AO-13 2 meter antenna will work well. People using omnis report success with the Pacsats running 50-70 watts to a J-Pole (N5VGC). Several people said they (or someone they know) have no trouble using RS-10 at lower power (10-25 watts) with simple, omnidirectional antennas. Again, it's a case of "try it and see if it works."

There was unanimous consensus that the receiving quipment (antenna, preamp, feedline, and receiver) is more important than the transmit equipment. Running more power "to hear yourself" is frowned upon, to say the least! It's also important to be able to vary uplink power to adjust to specific conditions. Both the Ten Tec 2510 and the Yaesu 736 have continuously variable power output (I guess the rest of us just have to fiddle with the drive controls on our rigs!).

ACCESSORIES AND OTHER STUFF:

You need a PSK modem to use the Pacsats. PacCom makes fully assembled units, either already integrated with their own TNC, or as a board you install in your TNC-2 clone. They make similar 9600 bps units for accessing UO-22. The downlink receiver (on 70 cm) should be capable of being tuned by the PSK modem's AFC lines. Newer radios can use the up/down lines from the microphone jack or an accessory connection on the rear panel. Older radios must be modified, or be tuned manually. N5VGC told me he sees about 20KHz of doppler on an AO-16 pass, and that without automatic tuning, operator workload is too high to do much else besides tune the receiver!

Just about any radio suitable for packet on 2 meters will work for AO-16, WO18, and LU-19. To run 9600 bps on UO-22, modifications to bypass the microphone and speaker's audio processing circuits are required. I've seen some reports on rec.radio.packet and in the various Hamsat columns that

differences between UO14 and UO-22's transmitters make UO-22 more difficult to copy. (I'll worry about that problem later - I'll start with AO-16 and LU-19 first!)

No one mentioned computers - again, it must be obvious (also, we're "talking" using computers!). They're handy, and you need one IN THE SHACK when working the Pacsats or for automated, real-time control of antenna rotators (useful for low altitude satellites).

Other operator aids mentioned, or I thought of on my own: If your radio can't slave uplink and downlink tuning (Ten Tec 2510 and Yaesu 736 can), you need something to help convert between uplink and downlink frequencies (and account for doppler shift and calibration errors on the radios' frequency readouts). A cardboard slide scale or dial will work. I'm thinking of programming my HP48 to do the conversion for me. You need something like this to know where to tune on the uplink to hear a given downlink frequency.

Software to track satellites and predict passes. There are many programs that work. Price ranges from free to $70 for state-of-the-art QuickTrack or InstantTrack (available from AMSAT). Special software is also needed to use the Pacsats, and to interpret telemetry data. This software is also available from the usual ham sources, and from AMSAT (BTW, software sales support the amateur satellite program!)

Polarity switchers optimize antenna performance by allowing switching antenna feeds from RHCP to LHCP as the need arises. They are a very useful add-on, but don't appear essential.

Equipment to measure power output, SWR, transmit frequency - all useful (see - satellites are not that different from HF!).

FREQUENCIES:

Amateur Radio Satellite Frequencies (as of January 1994)

Designation Frequencies Transponder/ Mode
Beacon
AO-10
Downlinks 145.810 B B
145.825-.975 T B
145.987 B B (Usually off)
Uplinks 435.027-.179 T B

RS-10
Downlinks 29.357 B A
29.360-.400 T A
29.403 B (Robot) A
145.857 B T/KT
145.903 B (Robot) T/KT
Uplinks 145.860-.900 T T/KT

RS-12
Downlinks 29.408 B K
29.410-.450 T K
29.454 B (Robot) K
145.913 B T/KT
145.959 B (Robot) T/KT
Uplinks 21.210-.250 T K

AO-13
Downlinks 145.812 B B
145.825-.975 T B
145.985 B B (Usually off)
435.651 B L/JL
435.677 RUDAK
435.715-6.005 T L/JL
2400.664 B S
2400.711-.749 T S
Uplinks 435.423-.573 T B/S
435.601-.637 T B/S

AO-16
Downlinks 437.02625 T/B J Dig. (1200b SSB) (secondary)
437.05130 T/B J Dig. (1200b Rai. Cos SSB) (pri)
2401.14280 B 1200 bps SSB (Usually off)
Uplinks 145.900 T 1200 bps AFSK FM Digital
145.920 T 1200 bps AFSK FM Digital
145.940 T 1200 bps AFSK FM Digital
145.960 T 1200 bps AFSK FM Digital

DO-17
Downlinks 145.82438 B 1200 bps AFSK FM or Dig Voice
145.82516 B 1200 bps AFSK FM or Dig Voice
2401.22050 B 1200 bps BPSK (SSB) (usually off)
Uplinks None

WO-18
Downlink 437.10200 B 1200 bps BPSK, J Dig (Telem, Image)
Uplink None

LO-19
Downlinks 437.125 T/B J Digital (secondary)
437.127 B CW
437.154 T/B J Digital (primary)
Uplinks 145.840 T 1200 bps AFSK FM Digital
145.860 T 1200 bps AFSK FM Digital
145.880 T 1200 bps AFSK FM Digital
145.900 T 1200 bps AFSK FM Digital

FO-20
Downlinks 435.795 B J Analog
435.800-.900 T J Analog (See below)
435.910 T/B 1200 bps BPSK (SSB), J Digital
Uplinks 145.850 T 1200 bps AFSK FM Digital

145.870 T 1200 bps AFSK FM Digital
145.890 T 1200 bps AFSK FM Digital
145.910 T 1200 bps AFSK FM Digital
OR 145.900-6.00 T CW/SSB (Alternates with above
every other week. Changes on
Wednesdays)

AO-21
Downlinks 145.852-.932 T CW/SSB
145.866-.946 T CW/SSB
145.985 Repeater FM (Alternates with voice
bulletins and telemetry)
Uplinks 435.022-.102 T CW/SSB
435.601-.637 T CW/SSB
435.015 Repeater FM (See above)

UO-22
Downlink 435.120 T 9600 bps FM Digital
Uplinks 145.900 T 9600 bps FM Digital
145.975 T 9600 bps FM Digital

KO-23 (KITSAT)
Downlink 435.175 T 9600 bps FM Digital
Uplinks 145.850 T 9600 bps FM Digital
145.900 T 9600 bps FM Digital

Mir
Downlink 145.55 T/Robot (Packet mailbox. Alternates
with simplex FM voice QSOs
occasionally)

KO-25 (KITSAT-B)
Downlink 435.175/436.500 MHz 9600 bps FSK FM Digital
Uplink 145.870/145.980 MHz 9600 bps FSK FM Digital

AO-26 (ITAMSAT)
Downlink 435.867 MHz 1200 bps PSK Digital
Uplinks 145.875 MHz 1200 bps FM Digital
145.900 MHz 1200 bps FM Digital
145.925 MHz 1200 bps FM Digital
145.950 MHz 1200 bps FM Digital

AMRAD (not yet active)
Downlink 436.900 MHz 9600 bps FSK FM
Uplink 145.850 MHz 9600 bps FSK FM

PO-28
Uplink 145.975 MHz JD 9600 bps FSK (Primary)
145.925 MHZ JD 9600 bps FSK (Secondary)
Downlink 435.075 MHz JD 9600 bps FSK (Primary)
435.050 MHz JD 9600 bps FSK (Secondary)
Note: PoSat will be available to all radio amateurs from January 28, 1994.

COMMENTS:

Any comments can be sent directly to me, stephen@mail.boi.hp.com. Enjoy.

____ ____
| / /_ __\ | Disk Stephen Holmstead N7TQL All comments (c)1994
| | / / /_/ | | Memory ...!hplabs!hpdmd48!stephen Opinions are mine,
|___\ / /___| Division stephen@mail.boi.hp.com not my employer's.

310. Re: Satellite FAQ answers (long)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 01:34:03 UTC
From: tstader@aol.com
Message-ID: <2ku62b$u5@rmg01.prod.aol.net>
Source record: 28064

Excellent, excellent, excellent! A great asset to the satellite shy users out there!

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Internet: tstader@aol.com (files <28K) or
p00489@psilink.com (files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM
ka8scp@ka8scp.ampr.org [44.56.4.82] Mac
ka8scp-1@ka8scp-1.ampr.org [44.56.4.120] DOS Clone
(they're BOTH pc's!)

311. APRS operations on 145.79???

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 05:52:41 UTC
From: russell@spdcc.com
Message-ID: <CLz1nv.2sn@spdcc.com>
Source record: 28065
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.digital.misc

Hello all,

Recently, amateurs in the Omaha area where I live have been looking into
getting an APRS network set up, and one thing that's been a concern of
several people (myself included) is the fact that the "standard" frequency
that is being used for APRS is 145.79 mHz.

This seems to us to be much too close to the 145.80-146.00 satellite
band, especially given the fact that APRS is designed for wide-area operation
and people will probably be running some high-powered digipeaters, at least
on a temporary basis for special events and probably on a permanent basis.

It has also been mentioned that this frequency falls in a subband that
has been suggested for experimental uses, and a permanent packet network
based on established AX.25 protocols hardly seems experimental.

What do you think? Are we being paranoid, or is it just that APRS
isn't popular enough for people to have noticed? I'd like to see this
discussed before people sart putting up fixed-frequency remote digis, etc
that will be VERY hard to get moved. APRS looks like a great system, and
I think it does need a coordinated frequency, but I don't think 145.79
should be that frequency.

--
Tim Russell n0zhy@wd0har.#ene.ne.us.na russell@spdcc.com
Most people would rather have comfort than freedom. The paradox is that you
can't really have the former, in the long term, unless you have the latter.
-- Amanda Walker

312. Re: APRS operations on 145.79???

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 06:37:38 UTC
From: enge@enge.almaden.ibm.com
Message-ID: <2kunri$nos@juniper.almaden.ibm.com>
Source record: 28066

145.71, .73, .75., .77, and .79 are all in use for packet in Northern California and have been for several years.

Roy Engehausen
enge@almaden.ibm.com

313. Re: Satellite FAQ answers (long)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 10:21:11 UTC
From: Kueppers@uni-bonn.de
Message-ID: <16F6C91A0S85.UPP200@ibm.rhrz.uni-bonn.de>
Source record: 28067

Thanks a lot. Your posting gave me all the information I have been hunting around for in the last 6 months. A lot of documents exists that will give you a general overview on the topic, but none has all the precise and up to date information one needs in order to actually start listening for satellites on the bands. This was very much needed. Thanks again.

Guido (df2kw)

314. Re: Satellite progs on World

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 11:13:11 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CLzGHz.558@bbc.co.uk>
Source record: 28068
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

Scott Ehrlich (wy1z@netcom.com) wrote:

: I have now placed some satellite tracking programs on World:

: - stsplus.zip

: - stsorbit.zip

: - traksat {trak300a.zip & trak300b.zip} (latest version of traksat)

: They are available via anonymous FTP via

: ftp ftp.std.com:/pub/hamradio/pc/satellite

Just a short comment. I have traksat and it is really great and dead easy
to use.

John B
John.boyer@rd.eng.bbc.co.uk

315. Re: GPS information/schematics

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 14:56:48 UTC
From: gopstein@helix.bms.com
Message-ID: <1994Mar1.145648.5520@synapse.bms.com>
Source record: 28069

In article <2971474522.0.p00926@psilink.com> p00926@psi.com writes:
>Hello netters,
> I'm looking for information/schematics on how to make a GPS reciever.
> It must be fairly simple to make and cost around $10.00 to build. :-)
> Seriously though, I'd like it to be resonable in price. I want to build
> one to use for making maps for orienteering and also to track myself
> on excursions into the deep woods. There is nothing I can't handle
> in the digital world but the world of high frequency analog is kind
> of a mystery. Any help would be greatly appreciated.
>

Forget about building the actual receiver, I don't believe that mere mortals would have much success -- the GPS signal is extremely complicated.

You can, however, buy an OEM GPS receiver (mine was a Magellan) and build a handheld case and display around it. That's what I did. I used a Motorola 68HC705 microprocessor and a 16x2 LCD display. The boards use regular asynch serial at normal baud rates for communications, so interfacing is really easy.

At the time, however, the price of complete handheld units was much higher than the cost of the receiver boards. That's not really true any more. The board I bought was about $400, which is in the ballpark of what you can get complete GPS units for now.

Rich, KD2CQ
--
Rich Gopstein

gopstein@bms.com
rutgers!bms.com!gopstein

316. SATNODE ???

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 16:25:54 UTC
From: John@jh.mcc.ac.uk
Message-ID: <John.1.0@jh.mcc.ac.uk>
Source record: 28070

I have been asked to look out for a program called SATNODE for the PC, which acts as a gateway to the packet satellites and allows unattended operation with automatic forwarding etc...

John, G1YYH

J.Heaton@MCC.ac.uk

317. Re: Satellite progs on World

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 19:31:15 UTC
From: smiller@intelsun.rus.uni-stuttgart.de
Message-ID: <2l0563$sk6@info2.rus.uni-stuttgart.de>
Source record: 28071

John.boyer@rd.eng.bbc.co.uk writes:
: Just a short comment. I have traksat and it is really great and dead easy
: to use.

TrakSat 3.00 or something earlier? I've run 2.7, 2.8 and 3.0, and
it appears to me that 3.0 takes a step backwards. OK, it's completely
re-written in C, and it has nice pull-down menus plus a couple of new
[relatively small] features, but it's slower than 2.8, the map it draws
for ground-tracks is distorted (stretched out vertically), AND it's buggy
(it crashes my PC easily if I make minor configuration errors). I have
a list of a number of bugs that I'm about to send to the author, along
with registration money for version 2.8!

I'm sticking with version 2.8 for now! TrakSat 2.8 is clearly my
favorite tracking program, and I've tried most all of the publicly
available ones at one time or another (though I must admit PCT is pretty
nice too).

Anyone else have similar experience with the "new" TrakSat?

--Shannon, DL6SEU
Stuttgart, Germany

318. Re: Satellite progs on World

Newsgroup: rec.radio.amateur.space
Date: 1994-03-01 20:37:07 UTC
From: ian@isis.demon.co.uk
Message-ID: <762554227snz@isis.demon.co.uk>
Source record: 28072
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <wy1zCLLyFJ.IpF@netcom.com> wy1z@netcom.com "Scott Ehrlich" writes:

>
>I have now placed some satellite tracking programs on World:
>
>- stsplus.zip
>
>- stsorbit.zip
>
>- traksat {trak300a.zip & trak300b.zip} (latest version of traksat)
>
>
>They are available via anonymous FTP via
>
>ftp ftp.std.com:/pub/hamradio/pc/satellite
>
>
>If you have any problems, questions, or comments, please e-mail them to me.
>
>I tried very hard to search for stsplus through many archie searches, and
>only found one site which carried it. I hope that by making it available
>on World it will be easier to obtain.

Ah, but which version of STSPLUS is it ? The damned thing gets updated
two or three times a year, or so it seems. The version numbering is pretty
unusual as well. For what it's worth, the latest I've seen is 9353, which
if I recall the method makes it the last week in '93. 9333 was the last
major upgrade.

Regards
Ian.
--

| Ian Smith | "The Moving Finger writes;
| ian@isis.demon.co.uk | and, having writ, Moves on."

319. Re: GPS information/schematics

Newsgroup: rec.radio.amateur.space
Date: 1994-03-02 02:10:09 UTC
From: zeus@myth.demon.co.uk
Message-ID: <762574209snz@myth.demon.co.uk>
Source record: 28073

In article <1994Mar1.145648.5520@synapse.bms.com>
gopstein@helix.bms.com "Rich Gopstein" writes:

> In article <2971474522.0.p00926@psilink.com> p00926@psi.com writes:

> >Hello netters,
> > I'm looking for information/schematics on how to make a GPS reciever.
> > It must be fairly simple to make and cost around $10.00 to build. :-)
> > Seriously though, I'd like it to be resonable in price. I want to build
> > one to use for making maps for orienteering and also to track myself
> > on excursions into the deep woods. There is nothing I can't handle
> > in the digital world but the world of high frequency analog is kind
> > of a mystery. Any help would be greatly appreciated.
> >
>
> Forget about building the actual receiver, I don't believe that mere
> mortals would have much success -- the GPS signal is extremely
> complicated.
>
> You can, however, buy an OEM GPS receiver (mine was a Magellan) and
> build a handheld case and display around it. That's what I did. I
> used a Motorola 68HC705 microprocessor and a 16x2 LCD display. The
> boards use regular asynch serial at normal baud rates for
> communications, so interfacing is really easy.
>
> At the time, however, the price of complete handheld units was much
> higher than the cost of the receiver boards. That's not really true
> any more. The board I bought was about $400, which is in the ballpark
> of what you can get complete GPS units for now.

I built the majority of a GPS system using a pair of pre-release chips
(GP1010+GP1020) from GEC-Plessey. In the end I never got around to developing
the software. The chipset would cost about $150 now I would estimate. It is
highly unlikely you could build one small enough to use for orienteering etc.
Your best bet is to get a commercial one (they are getting much cheaper now).
Or, alternatively, you could get a PCMCIA plug in GPS card and a small
notebook type computer.

Note that in heavily wooded conditions and near mountains etc, signal
reflections are going to degrade your positioning to about +/- 1/4 mile or
so!

--

Michael S. Cowgill (Mike) _ My opinions! MINEMINEALLMINEHAHAHAHA!
zeus@myth.demon.co.uk (That's me) _ #include <witticism.h> or if #undef

G1VOX@GB7WRG.GBR.EU 44.131.2.76 _ " ...Cracking toast Grommit!...

320. Re: Satellite progs on World

Newsgroup: rec.radio.amateur.space
Date: 1994-03-02 12:03:37 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CM1DI1.GsJ@bbc.co.uk>
Source record: 28074
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

John Boyer (boyer@rd.eng.bbc.co.uk) wrote:
: Scott Ehrlich (wy1z@netcom.com) wrote:

: : I have now placed some satellite tracking programs on World:

: : - stsplus.zip

: : - stsorbit.zip

: : - traksat {trak300a.zip & trak300b.zip} (latest version of traksat)

: : They are available via anonymous FTP via

: : ftp ftp.std.com:/pub/hamradio/pc/satellite

: Just a short comment. I have traksat and it is really great and dead easy
: to use.

: John B
: John.boyer@rd.eng.bbc.co.uk

Sorry. Did I say traksat? I actually meant Satra version 1.0. That's the
problem with all these sat tracking progs what to call them.
I have played with tracksat 3 and I found it hard to drive.

John B
John.boyer@rd.eng.bbc.co.uk

321. COMMON SATELLITE FREQUENCIES LISTINGS

Newsgroup: rec.radio.amateur.space
Date: 1994-03-02 16:34:23 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.1RXkic1w165w@asarin.org.ar>
Source record: 28075

```
COMMON SATELLITE FREQUENCIES LISTINGS (MAY 1993 UPDATE)

00965:TRANSIT 5BN 5 :136.650 NAVIGATION
02608:ATS-1 :135.555,135.575,135.600 COMMUNICATION
:ATS-1 :135.625,135.645,137.350 COMMUNICATION
03029:ATS-3 :137.37,137.350 COMMUNICATION
04320:AO-5 :29.450,144.05 AMATEUR *1
06236:AO-6 :29.450 AMATEUR *1
06909:OSCAR 20 :149.9875,399.9680 NAVIGATION
07530:AO-7 :29.502,145.975,435.100 AMATEUR *1
08366:GOES 1 :136.380 WEATHER
10061:GOES 2 :136.380 WEATHER
10637:IUE :136.860 EXPLORER
10703:AO-8 :29.402,435.095 AMATEUR *1
10953:GEOS 3 :136.380 WEATHER
11054:GPS-03 :1227.600 NAVIGATION
12458:NOVA I :149.9875,399.9680 NAVIGATION
12544:METEOSAT 2 :137.078 WEATHER
12553:NOAA 7 :137.620 WEATHER *1
13010:MARECS-A :137.170 GEOSTATIONARY
13362:NOVA III :149.9875,399.9680 NAVIGATION
13367:LANDSAT 4 :137.860 EARTH RESOURCES
13386:MARECS-B2 :137.170 GEOSTATIONARY
13923:NOAA 8 :137.500 WEATHER *1
14129:AO-10 :145.810,145.989,436.020 AMATEUR
:AO-10 :436.040 AMATEUR
14189:GPS-08 :1227.600 NAVIGATION
14372:COSMOS 1500 :137.400,466.500 OCEANOGRAPHIC
14781:UO-11 :145.825 AMATEUR
15039:GPS-09 :1227.600 NAVIGATION
15271:GPS-10 :1227.600 NAVIGATION
15427:NOAA 9 :137.620,137.770 WEATHER
15936:OSCAR 30 :149.9875,399.9680 NAVIGATION
16129:GPS-11 :1227.600 NAVIGATION
16609:MIR :121.125,121.750,130.165 SPACE STATION
:MIR :139.205,143.625,145.500 SPACE STATION
:MIR :145.550,145.900,231.000 SPACE STATION
:MIR :233.000,247.000,249.000 SPACE STATION
:MIR :417.000,463.000 SPACE STATION
16969:NOAA 10 :137.500,136.770 WEATHER
17066:COSMOS 1791 :150.000,400.00 NAVIGATION
17070:POLAR BEAR :149.9875,399.9680 NAVIGATION
18122:RS 10/11 :29.357,29.403,145.857 AMATEUR
:COSMOS 1861 :145.903,29.403,29.453 AMATEUR
```

:COSMOS 1861 :145.907,145.953 AMATEUR
18312:METEOR 2-16 :137.400 WEATHER
18361:OSCAR 27 :149.9875,399.9680 NAVIGATION
18362:OSCAR 29 :149.9875,399.9680 NAVIGATION
18820:METEOR 2-17 :137.300 WEATHER
19070:OSCAR 23 :149.9875,399.9680 NAVIGATION
19071:OSCAR 32 :149.9875,399.9680 NAVIGATION
19215:METEOSAT 3 :137.080 WEATHER
19216:AO-13 :145.8125,145.975,435.650 AMATEUR
:AO-13 :435.675,145.950,145.955 AMATEUR
19223:NOVA II :149.9875,399.9680 NAVIGATION
19336:METEOR 3-2 :137.850 WEATHER
19419:OSCAR 25 :149.9875,399.9680 NAVIGATION
19420:OSCAR 31 :149.9875,399.9680 NAGIGATION
19531:NOAA 11 :137.620,137.770 WEATHER
19802:GPS BII-01 :1227.600 NAVIGATION
19826:COSMOS 2004 :149.940,399.840 NAVIGATION *1
19851:METEOR 2-18 :137.300 WEATHER
20045:COSMOS 2006 :149.970,399.920 NAVIGATION *1
20061:GPS BII-02 :1227.600 NAVIGATION
20185:GPS BII-03 :1227.600 NAVIGATION
20302:GPS BII-04 :1227.600 NAVIGATION
20305:METEOR 3-3 :137.850 WEATHER
20361:GPS BII-05 :1227.600 NAVIGATION
20437:UO-14 :435.070 AMATEUR
20438:UO-15 :435.120 AMATEUR
20439:PO-16 PACSAT :437.025,437.050 AMATEUR
20440:DO-17 DOVE :145.825 AMATEUR
20441:WO-18 WEBERSAT :437.075,437.105 AMATEUR
20442:LO-19 LUSAT :437.155,437.125 AMATEUR
20452:GPS BII-06 :1227.600 NAVIGATION
20480:FO-20 :435.910,435.795 AMATEUR
20508:NADEZHDA 2 :150.000,400.00 NAVIGATION
20577:COSMOS 2074 :149.910,399.760 NAVIGATION *1
20670:METEOR 2-19 :137.850 WEATHER
20724:GPS BII-08 :1227.600 NAVIGATION
20788:FENGYUN 1B :137.795 WEATHER
20826:METEOR 2-20 :137.850 WETHER
20830:GPS BII-09 :1227.600 NAVIGATION
20959:GPS BII-10 :1227.600 NAVIGATION
21087:AO-21 :145.985,145.825,145.950 AMATEUR
:AO-21 :145.8375,145.800 AMATEUR
21089:COSMOS 2123 :150.000,400.00 NAVIGATION
21089:RS 12/13 :29.408,29.454,145.915 AMATEUR
:RS 13/13 :145.960,29.458,29.504 AMATEUR
:RS 12/13 :145.865,145.910 AMATEUR
21130:COSMOS 2135 :149.970,399.920 NAVIGATION *1
21152:NADEZHDA 3 :150.000 NAVIGATION
21230:COSMOS 2142 :150.030,400.080 NAVIGATION
21232:METEOR 3-4 :137.300 WEATHER

21263:NOAA 12 :137.500,136.770 WEATHER
21552:GPS BII-11 :1227.600 NAVIGATION
21575:UO-22 :435.120 AMATEUR
21578:SARA :145.955 ???????
21655:METEOR 3-5 :137.850 WEATHER
21666:COSMOS 2154 :149.940,399.840 NAVIGATION *1
21796:COSMOS 2173 :149.970,399.920 NAVIGATION
21798:DMSP B5D2-6 :137.500,136.770 WEATHER (MILITARY)
21875:COSMOS 2180 :149.940,399.840 NAVIGATION
21890:GPS BII-12 :1227.6 NAVIGATION
21902:COSMOS 2181 :150.000,400.000 NAVIGATION
21930:GPS BII-13 :1227.6 NAVIGATION
21937:COSMOS 2184 :149.910,399.760 NAVIGATION
21975:COSMOS 2190 :149.940,399.840 NAVIGATION
21980:COSMOS 2191 :150.000,400.000 NAVIGATION
22006:COSMOS 2195 :149.970,399.920 NAVIGATION
22014:GPS BII-14 :1227.6 NAVIGATION
22077:KITSAT A :435.175 AMATEUR
22078:SSO/T :137-139 ??
22108:GPS BII-15 :1227.6 NAVIGATION
22161:FREJA :400.550 AURORA RESEARCH
22207:COSMOS 2218 :149.940,399.840 NAVIGATION
22231:GPS BII-16 :1227.6 NAVIGATION
22275:GPS BII-17 :1227.6 NAVIGATION
22319:SOYUZ TM-16 :121.125,121.750,130.167 MANNED FLIGHT
:SOYUS TM-16 :139.208,143.625,231.000 MANNED FLIGHT
:SOYUS TM-16 :233.000,247.000,249.000 MANNED FLIGHT
:SOYUS TM-16 :417.000,463.000 MANNED FLIGHT
22446:GPS BII-18 :1227.6 NAVIGATION
22487:COSMOS 2233 :150.030,400.080 NAVIGATION
:ARSENE :145.975,2446.540 AMATEUR
22490:SCD-1 :401.620,401.650 WEATHER
22530:PROGRESS TM-16 :166.000,165.000,922.755 SUPPLY SHIP

*1 No longer transmitting. Kept for reference.

NOTE: Here are some FLTSATCOM Frequencies reported to be in use. These
frequencies are either DATA or VOICE or both.

244.0950 261.6500 262.2500 269.0700
248.9000 261.6750 262.3000 269.4750
249.5500 261.7000 262.4750 269.5500
250.4500 250.5500 259.7000 261.9000
262.5500 269.8000 261.4500 261.9500
262.9500 269.9500 261.4750 262.1000
263.6250 288.0000 261.5250 262.2250
264.9000 295.0750 261.6000
-END-

322. Space Shuttle Radio Frequency List

Newsgroup: rec.radio.amateur.space
Date: 1994-03-02 16:34:26 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.4RXkic1w165w@asarin.org.ar>
Source record: 28076

Space Shuttle Radio Frequency List
By Rich Weinkauf, Farmington, MI
STSFRQ03.TXT

A Space Shuttle mission requires the coordination of thousands of individuals; both on the planet, and off. This coordination is directed largely by radio communications, both voice and digital; and supplies the communications enthusiast with several opportunities for listening. The following list includes radio voice communication frequencies reported to be in use during a typical Space Shuttle mission. This list has been gleaned from many sources, including personal communications, messages on Prodigy, Amateur Radio Bulletin Boards, Space and Astronomy Bulletin Boards, and the NASA Spacelink BBS. All of it is subject to change without notice, and reception is dependent on your location and the propagation conditions.

I can be reached for additions, deletions, and corrections to this list via:

Packet radio: N8QLT @ WD8DWO.#semi.mi.us.na
CompuServe: 70534,227
Internet: 70534.227@compuserve.com
Prodigy: BNCG39A

Launch and Landing Operations

NASA Malabar/Palm Bay, FL Nets (in KHz, USB commonly)
Solid rocket booster recovery 2622 primary, 2764, 3187, 4510, 7765, 11407, 11621
NASA tracking vessels 5180, 5187
ETR range control 2678
ETR primary night channel 5190
ETR secondary night channel 5810
ETR primary day channel 10780
ETR secondary day channel 20390
Launch support ships 5680, 11104, 11252, 18009, 19303
Launch support aircraft 5350, 7676, 9022, 9043, 9132, 13227, 13878
Cape Radio/Leader 4856
Cape radio/Coast Guard Ships 4992
Cape Radio/Launch support A/C 7461
Cape radio 6896, 6837, 11414, 11548, 19640, 23413
S&R Coast Guard primary 3024
S&R Primary recovery zone 4376
S&R Primary Atlantic 6720
S&R comm with Bahamas 7412
Backup mission audio 2664

Navy harbor control 2716
Launch tracking net 7525, 20186
Space missle tactical net 10305
OCC Shuttle mission audio 20198
NASA CB radio channel 9 27065 AM
Data buoys 2405
Data channels 7919, 7985, 13237, 13495
Malabar-Ascencion Island MUX 10310, 13600, 20192
Ascencion Island-Malabar MUX 14937, 19966, 22755
USAF/NASA communications 4510, 4760, 4855, 4992, 5350, 5810,
6727, 6740, 8993, 9315, 9974, 10780,
11104, 11414, 11548, 14615, 19303,
19984, 20191, 20475

Edwards AFB: (frequencies in MHz)
116.4 00 ATIS
120.7 00 control tower
121.8 00 ground control
126.100, 127.800 approach control
133.650 approach/departure control
138.450 commandpost
149.925 security
162.6125 NASA ops
164.1 00 NASA
173.5875 fire
236.6 00 control tower
269.9 00 ATIS
290.3 00 departure control
318.1 00 tower
348.7 00 approach control
372.2 00 dispatchers
390.1 00 ground control

Kennedy Space Center Operations (KHz)
2182, 3023

Kennedy: (MHz)
117.8 00 shuttle control
121.750, 126.300 ground control
126.650 weather
142.500, 143.040 cranes
148.455 NASA booster recovery
148.485 launch countdown/status
148.500, 149.100 Search and Rescue ships
149.175 shuttle crawler
162.000 Search and Rescue ships
162.0125 NASA vessels
162.6125 NASA ops
163.4625, 163.4875 security
163.5125 security
163.5625 fire - primary

164.0 00 radiation checks
164.800 Search and Rescue aircraft
165.1875 check points
170.150 base operations
170.175 transportation
170.350 public relations
170.400 General Services Administration
171.150 maintenance/fuel
171.2625 camera tracking
173.175 security - gates
173.4375 medics
173.5625 fire/rescue
173.6625 safety units
173.6875 security - vans
173.7875 fire - secondary
284.0 00 ground control

Kennedy Space Center Ground Support (MHz)
148.480, 149.170, 162.610, 163.460, 163.480, 163.510, 163.560, 165.190,
170,150, 170.170, 170.350, 171.150, 171.260, 173.560, 173.680

Patrick AFB: (MHz)
118.400 approach/departure control
121.700 ground control
125.100 approach control
126.200 control tower
128.800 dispatcher
138.300 command post
273.500 ATIS
335.800 ground control
340.900 approach/departure control
344.600 weather
348.400 control tower
358.300 approach control
372.200 dispatchers

International emergency air frequencies (MHz)
121.500
243.000

Shuttle frequencies: (MHz)
296.800 primary, air-to-ground or orbiter-to-suit
259.700 air-to-ground or suit-to-orbiter
279.000 suit-to-orbiter or suit-to-suit

Communications and other stuff: S-band (MHz)
2205.000 Air-to-ground
2217.500 Air-to-ground secondary
2287.500 Air-to-ground primary digital downlink
2041.900 Ground-to-air
2201.400 Ground-to-air
1831.800 primary (USAF uplink, phase modulation)

1775.100 secondary
2250.000 wide band FM with main engine analog
telemetry during launch, or TV during orbit
operations.

Note from Ron Parise, WA4SIR, on above S-band frequencies: "The S-band system is one of the primary orbiter downlink bands. The voice channels are digital slope delta modulation and are MUX'ed in with the rest of orbiter telemetry very difficult to copy. Much of the downlink TV is S-band wide band FM and should be easy to copy.

The Ku-band system is used in conjunction with the TDRS satellites, and is used more heavily during Spacelab flight than others. The data rate is very high digital (50 Mbits/sec), and will be nearly impossible for you to demodulate and decommutate in your basement. Nevertheless, the shuttle transmits on 15.003 GHz. These transmission are directed toward the TDRS satellite with a high gain antenna, and cannot be copied from the gound.

The UHF frequencies are fun to listen to, but are not heavily used except during EVA's. You will almost always hear some activity on them during a mission, just be patient."

Ron WA4SIR

Contractors
Rockwell (Edwards)
2995.5, 3282.5, 3475.5, 5597.5, 10010.5, 17966.5 (kHz, USB)
122.800, 123.050, 123.350, 123.525, 462.925 (MHz)

Rockwell (Edwards/Kennedy)
123.475 (MHz)

McDonnell Douglas (Edwards)
123.300, 123.550 (MHz)

Com-Tech Associates (Kennedy)
151.955 (MHz)

IBM & Harris Corp. (Kennedy)
152.480 (MHz)

TWA (Kennedy)
154.515 (MHz)

-END-

323. Satellite Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-03-02 23:57:23 UTC
From: j2yc@jupiter.sun.csd.unb.ca
Message-ID: <1994Mar2.235723.1769@jupiter.sun.csd.unb.ca>
Source record: 28077

I am testing an HTTP server that is dedicated to ham radio..

Those with mosaic (with form capability) can try it out at
http://jupiter.sun.csd.unb.ca:7000

In the "SPACE" section, there is an option to get the latest
satellite keps... This option will let you compute satellite
trajectories based on info that you enter using the pull down menus.

Another thing I wrote is an online callbook which executes an
expect script to search for a callsign but that has been done
already and isn't very exciting..

The guts to the keplerian element thing I wrote was from "n3emo orbit"
..... a very much hacked apart orbit. It outputs in HTML format
and runs in batch mode using a single command line argument as
provided by mosaic using the "GET" option in the forms..

later
Derek
VE1DJB

--
Derek J. Billingsley	"When the walls come tumbling
University of New Brunswick	in - though we may deserve
j2yc@jupiter.sun.csd.unb.ca	it, it will be worth it".
---

324. Re: Mir

Newsgroup: rec.radio.amateur.space
Date: 1994-03-03 17:40:47 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Mar3.174047.5190@ke4zv.atl.ga.us>
Source record: 28078

In article <Troyce-020394085113@idmb-secretary.tamu.edu> Troyce@bio.tamu.edu (Troyce) writes:
>According to the latest orbital data, the Mir should be orbiting almost
>directly overhead of me late Friday morning and only about 389 km in
>distance. Would I have any real chance of picking them up (if they're
>transmitting) using only a HT, or would I need a base rig and satellite
>antenna?

The HT should work. Try to get on a high rooftop to increase your horizon. A better antenna than the typical duck would be a big help though. Even a homemade J-pole should suffice.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

325. Re: SATNODE ???

Newsgroup: rec.radio.amateur.space
Date: 1994-03-03 18:07:26 UTC
From: wroth@netcom.com
Message-ID: <wrothCM3p0G.35y@netcom.com>
Source record: 28079

John Heaton (John@jh.mcc.ac.uk) wrote:
: I have been asked to look out for a program called SATNODE for the PC, which
: acts as a gateway to the packet satellites and allows unattended operation
: with automatic forwarding etc...

: John, G1YYH

: J.Heaton@MCC.ac.uk
--
wroth@netcom.com

326. Re: Mir

Newsgroup: rec.radio.amateur.space
Date: 1994-03-03 20:01:03 UTC
From: tedwards@eng.umd.edu
Message-ID: <2l5flv$dns@mojo.eng.umd.edu>
Source record: 28080

In article <Troyce-020394085113@idmb-secretary.tamu.edu> Troyce@bio.tamu.edu (Troyce) writes:
>According to the latest orbital data, the Mir should be orbiting almost
>directly overhead of me late Friday morning and only about 389 km in
>distance. Would I have any real chance of picking them up (if they're
>transmitting) using only a HT, or would I need a base rig and satellite
>antenna?

You have a very good chance of hearing MIR on an HT...but keep in mind they are usually doing packet. I have heard MIR on an HT during a voice QSO with W3EAX. All LEO sats can be definately heard with a mag-mount quarter-wave or 5/8 wave vertical, no problem. You only really need satellite antennas to hear elliptical orbit sats such as AO-13.

You have little chance of making it through the typical pileup into either packet or voice modes with an HT. If you were the only ham within the line-of-sight, you might have a chance to hit them, depending on MIR orientation to you.

-Thomas
N3HAU

327. Re: SATNODE ???

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 04:07:02 UTC
From: wroth@netcom.com
Message-ID: <wrothCM4Grq.60M@netcom.com>
Source record: 28081

: John Heaton (John@jh.mcc.ac.uk) wrote:
: : I have been asked to look out for a program called SATNODE for the PC, which
: : acts as a gateway to the packet satellites and allows unattended operation
: : with automatic forwarding etc...

: : John, G1YYH

The program you're looking for was written by John Hansen, WA0PTV. I
believe that he is on the internet at wa0ptv@amsat.org. I'm sure that
he'd be glad to help you out.

If you drop him a line, tell him I said hello!

73's,
Wayne Roth
WA2N / 5.
--
wroth@netcom.com

328. Re: Satellite progs on World

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 09:14:59 UTC
From: rickvg@cscns.com
Message-ID: <JmITjSEHGIGK057yn@cscns.com>
Source record: 28082
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <762554227snz@isis.demon.co.uk>, Ian Smith wrote:
>Ah, but which version of STSPLUS is it ? The damned thing gets updated
>two or three times a year, or so it seems. The version numbering is pretty
>unusual as well. For what it's worth, the latest I've seen is 9353, which
>if I recall the method makes it the last week in '93. 9333 was the last
>*major* upgrade.
>

Yep, it is updated practically monthly. I have 9405 right now. A nice
program. Especially when the shuttle is up and running.

73 -- Rick

Rick von Glahn
rickvg@cscns.com -- Internet (preferred)
74620,637 -- Compuserve
N0KKZ@W0GVT.#NECO.CO.USA -- packet radio

329. ORBS$063.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 13:34:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-063.o.1994@ampr.org>
Source record: 28083
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-063.O
Orbital Elements 063.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SAT
FROM WA5QGD FORT WORTH,TX March 4, 1994
BID: $ORBS-063.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94059.96429348
Element set: 264
Inclination: 027.2018 deg
RA of node: 339.3804 deg
Eccentricity: 0.6027104
Arg of perigee: 158.3802 deg
Mean anomaly: 245.0891 deg
Mean motion: 02.05875835 rev/day
Decay rate: 2.64e-06 rev/day^2
Epoch rev: 8055
Checksum: 311

Satellite: UO-11
Catalog number: 14781
Epoch time: 94044.54889300
Element set: 664
Inclination: 97.7907 deg
RA of node: 65.0254 deg
Eccentricity: 0.0011279
Arg of perigee: 310.7761 deg
Mean anomaly: 49.2455 deg
Mean motion: 14.69144313 rev/day
Decay rate: 3.63e-06 rev/day^2
Epoch rev: 53215
Checksum: 306

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94061.03883249
Element set: 877
Inclination: 082.9217 deg
RA of node: 048.0362 deg
Eccentricity: 0.0011441
Arg of perigee: 326.6023 deg
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Mean anomaly: 033.4997 deg
Mean motion: 13.72331967 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 33521
Checksum: 298

Satellite: AO-13
Catalog number: 19216
Epoch time: 94060.48894014
Element set: 888
Inclination: 057.8304 deg
RA of node: 265.6507 deg
Eccentricity: 0.7212956
Arg of perigee: 335.3196 deg
Mean anomaly: 002.8602 deg
Mean motion: 02.09730422 rev/day
Decay rate: 2.88e-06 rev/day^2
Epoch rev: 4375
Checksum: 318

Satellite: FO-20
Catalog number: 20480
Epoch time: 94046.42832899
Element set: 659
Inclination: 99.0216 deg
RA of node: 221.3367 deg
Eccentricity: 0.0539917
Arg of perigee: 255.4010 deg
Mean anomaly: 98.6634 deg
Mean motion: 12.83223845 rev/day
Decay rate: -1.4e-07 rev/day^2
Epoch rev: 18851
Checksum: 320

Satellite: AO-21
Catalog number: 21087
Epoch time: 94060.95526134
Element set: 439
Inclination: 082.9416 deg
RA of node: 222.0498 deg
Eccentricity: 0.0035939
Arg of perigee: 023.9104 deg
Mean anomaly: 336.4239 deg
Mean motion: 13.74533695 rev/day
Decay rate: -2.2e-07 rev/day^2
Epoch rev: 15485
Checksum: 311

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94044.66379265

Element set: 662
Inclination: 82.9220 deg
RA of node: 103.0678 deg
Eccentricity: 0.0030946
Arg of perigee: 91.8517 deg
Mean anomaly: 268.6203 deg
Mean motion: 13.74034946 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 15168
Checksum: 314

Satellite: ARSENE
Catalog number: 22654
Epoch time: 93338.80803910
Element set: 243
Inclination: 1.4104 deg
RA of node: 113.5274 deg
Eccentricity: 0.2936576
Arg of perigee: 161.9838 deg
Mean anomaly: 210.8642 deg
Mean motion: 1.42202044 rev/day
Decay rate: -8.7e-07 rev/day^2
Epoch rev: 299
Checksum: 278

/EX

330. ORBS$063.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 13:36:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-063.d.1994@ampr.org>
Source record: 28084
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-063.D
Orbital Elements 063.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX March 4, 1994
BID: $ORBS-063.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94046.18347456
Element set: 964
Inclination: 98.5953 deg
RA of node: 132.5942 deg
Eccentricity: 0.0010599
Arg of perigee: 186.2827 deg
Mean anomaly: 173.8225 deg
Mean motion: 14.29823413 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21215
Checksum: 317

Satellite: AO-16
Catalog number: 20439
Epoch time: 94045.75388848
Element set: 764
Inclination: 98.6038 deg
RA of node: 133.2765 deg
Eccentricity: 0.0010934
Arg of perigee: 188.0238 deg
Mean anomaly: 172.0765 deg
Mean motion: 14.29879034 rev/day
Decay rate: 7.6e-07 rev/day^2
Epoch rev: 21210
Checksum: 328

Satellite: DO-17
Catalog number: 20440
Epoch time: 94045.23034447
Element set: 763
Inclination: 98.6058 deg
RA of node: 133.0443 deg
Eccentricity: 0.0010965
Arg of perigee: 189.4352 deg
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Mean anomaly: 170.6623 deg
Mean motion: 14.30017107 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 21204
Checksum: 266

Satellite: WO-18
Catalog number: 20441
Epoch time: 94045.76328214
Element set: 765
Inclination: 98.6054 deg
RA of node: 133.5798 deg
Eccentricity: 0.0011505
Arg of perigee: 188.3662 deg
Mean anomaly: 171.7330 deg
Mean motion: 14.29993172 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 21212
Checksum: 309

Satellite: LO-19
Catalog number: 20442
Epoch time: 94045.74960276
Element set: 763
Inclination: 98.6048 deg
RA of node: 133.7927 deg
Eccentricity: 0.0011921
Arg of perigee: 187.6862 deg
Mean anomaly: 172.4137 deg
Mean motion: 14.30087334 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 21213
Checksum: 308

Satellite: UO-22
Catalog number: 21575
Epoch time: 94046.13690949
Element set: 465
Inclination: 98.4466 deg
RA of node: 123.0432 deg
Eccentricity: 0.0007219
Arg of perigee: 301.1937 deg
Mean anomaly: 58.8542 deg
Mean motion: 14.36890610 rev/day
Decay rate: 1.13e-06 rev/day^2
Epoch rev: 13555
Checksum: 302

Satellite: KO-23
Catalog number: 22077
Epoch time: 94046.40390865

Element set: 360
Inclination: 66.0810 deg
RA of node: 174.9628 deg
Eccentricity: 0.0009874
Arg of perigee: 317.5713 deg
Mean anomaly: 42.4539 deg
Mean motion: 12.86284764 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7112
Checksum: 311

Satellite: AO-27
Catalog number: 22825
Epoch time: 94046.21545311
Element set: 261
Inclination: 98.6626 deg
RA of node: 123.1936 deg
Eccentricity: 0.0008062
Arg of perigee: 202.2052 deg
Mean anomaly: 157.8775 deg
Mean motion: 14.27607193 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 2028
Checksum: 289

Satellite: IO-26
Catalog number: 22826
Epoch time: 94042.21058899
Element set: 261
Inclination: 98.6649 deg
RA of node: 119.2441 deg
Eccentricity: 0.0008529
Arg of perigee: 216.1988 deg
Mean anomaly: 143.8612 deg
Mean motion: 14.27708814 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 1971
Checksum: 325

Satellite: KO-25
Catalog number: 22830
Epoch time: 94045.75293537
Element set: 264
Inclination: 98.5674 deg
RA of node: 121.3071 deg
Eccentricity: 0.0011406
Arg of perigee: 172.0390 deg
Mean anomaly: 188.0975 deg
Mean motion: 14.28033386 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 2022

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Checksum: 286

/EX
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331. ORBS$063.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 13:41:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-063.w.1994@ampr.org>
Source record: 28085
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-063.W
Orbital Elements 063.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SAT
FROM WA5QGD FORT WORTH,TX March 4, 1994
BID: $ORBS-063.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94061.01035146
Element set: 730
Inclination: 099.0595 deg
RA of node: 110.1740 deg
Eccentricity: 0.0015036
Arg of perigee: 161.5961 deg
Mean anomaly: 198.6262 deg
Mean motion: 14.13593205 rev/day
Decay rate: -1.0e-07 rev/day^2
Epoch rev: 47520
Checksum: 271

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94060.99970033
Element set: 628
Inclination: 098.5075 deg
RA of node: 073.2639 deg
Eccentricity: 0.0013002
Arg of perigee: 284.1537 deg
Mean anomaly: 075.8728 deg
Mean motion: 14.24869344 rev/day
Decay rate: 2.06e-06 rev/day^2
Epoch rev: 38734
Checksum: 332

Satellite: MET
Catalog number: 18820
Epoch time: 94046.33979358
Element set: 262
Inclination: 82.5401 deg
RA of node: 5.5070 deg
Eccentricity: 0.0016642
Arg of perigee: 157.5160 deg
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Mean anomaly: 202.6730 deg
Mean motion: 13.84706663 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 30549
Checksum: 289

Satellite: MET
Catalog number: 19336
Epoch time: 94039.99790931
Element set: 262
Inclination: 82.5380 deg
RA of node: 54.3969 deg
Eccentricity: 0.0015730
Arg of perigee: 222.0779 deg
Mean anomaly: 137.9138 deg
Mean motion: 13.16964807 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 26638
Checksum: 335

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94061.00386846
Element set: 535
Inclination: 099.1626 deg
RA of node: 047.3332 deg
Eccentricity: 0.0012104
Arg of perigee: 074.4598 deg
Mean anomaly: 285.8484 deg
Mean motion: 14.12964394 rev/day
Decay rate: 3.54e-06 rev/day^2
Epoch rev: 28008
Checksum: 311

Satellite: MET
Catalog number: 19851
Epoch time: 94053.01405594
Element set: 263
Inclination: 082.5171 deg
RA of node: 235.7306 deg
Eccentricity: 0.0014002
Arg of perigee: 188.3029 deg
Mean anomaly: 171.8434 deg
Mean motion: 13.84356715 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 25175
Checksum: 295

Satellite: MET
Catalog number: 20305
Epoch time: 94052.02689974

Element set: 989
Inclination: 082.5516 deg
RA of node: 350.2887 deg
Eccentricity: 0.0006980
Arg of perigee: 212.2401 deg
Mean anomaly: 147.8826 deg
Mean motion: 13.04401818 rev/day
Decay rate: .00000000 rev/day^2
Epoch rev: 20775
Checksum: 292

Satellite: MET
Catalog number: 20670
Epoch time: 94040.79306496
Element set: 762
Inclination: 82.5504 deg
RA of node: 309.6649 deg
Eccentricity: 0.0016176
Arg of perigee: 139.0978 deg
Mean anomaly: 221.1403 deg
Mean motion: 13.84188455 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18299
Checksum: 328

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94061.01586847
Element set: 907
Inclination: 098.8380 deg
RA of node: 084.5670 deg
Eccentricity: 0.0013935
Arg of perigee: 308.8594 deg
Mean anomaly: 051.1838 deg
Mean motion: 14.01322350 rev/day
Decay rate: 3.77e-06 rev/day^2
Epoch rev: 17869
Checksum: 332

Satellite: MET
Catalog number: 20826
Epoch time: 94060.99109242
Element set: 777
Inclination: 082.5222 deg
RA of node: 231.2554 deg
Eccentricity: 0.0013686
Arg of perigee: 351.3644 deg
Mean anomaly: 008.7815 deg
Mean motion: 13.83573202 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 17293

Checksum: 295

Satellite: MET
Catalog number: 21232
Epoch time: 94044.59202931
Element set: 670
Inclination: 82.5391 deg
RA of node: 256.9674 deg
Eccentricity: 0.0013673
Arg of perigee: 130.9218 deg
Mean anomaly: 229.3059 deg
Mean motion: 13.16460015 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13509
Checksum: 285

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94061.06053707
Element set: 940
Inclination: 098.6272 deg
RA of node: 091.1459 deg
Eccentricity: 0.0012968
Arg of perigee: 186.5273 deg
Mean anomaly: 173.6274 deg
Mean motion: 14.22374247 rev/day
Decay rate: 2.14e-06 rev/day^2
Epoch rev: 14530
Checksum: 295

Satellite: MET
Catalog number: 21655
Epoch time: 94060.92535554
Element set: 682
Inclination: 082.5586 deg
RA of node: 192.4818 deg
Eccentricity: 0.0013979
Arg of perigee: 105.6381 deg
Mean anomaly: 254.6811 deg
Mean motion: 13.16827204 rev/day
Decay rate: -4.71e-06 rev/day^2
Epoch rev: 12234
Checksum: 316

Satellite: MET
Catalog number: 22782
Epoch time: 94061.07699856
Element set: 277
Inclination: 082.5414 deg
RA of node: 291.3236 deg
Eccentricity: 0.0022793

```
Arg of perigee: 163.8377 deg
Mean anomaly: 196.4020 deg
Mean motion: 13.83001482 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 02528
Checksum: 312

/EX
```

332. ORBS$063.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 13:43:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-063.m.1994@ampr.org>
Source record: 28086
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-063.M
Orbital Elements 063.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SAT
FROM WA5QGD FORT WORTH,TX March 4, 1994
BID: $ORBS-063.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94045.75585944
Element set: 254
Inclination: 98.6608 deg
RA of node: 122.7699 deg
Eccentricity: 0.0009759
Arg of perigee: 191.0097 deg
Mean anomaly: 169.0872 deg
Mean motion: 14.28003980 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 2022
Checksum: 326

Satellite: MIR
Catalog number: 16609
Epoch time: 94061.02012332
Element set: 154
Inclination: 051.6205 deg
RA of node: 003.6927 deg
Eccentricity: 0.0004649
Arg of perigee: 015.8866 deg
Mean anomaly: 344.2953 deg
Mean motion: 15.60576251 rev/day
Decay rate: 1.2762e-04 rev/day^2
Epoch rev: 45933
Checksum: 285

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94060.95287285
Element set: 452
Inclination: 028.4689 deg
RA of node: 204.7466 deg
Eccentricity: 0.0006400
Arg of perigee: 049.7311 deg
```

Mean anomaly: 310.4334 deg
Mean motion: 14.90500352 rev/day
Decay rate: 4.86e-06 rev/day^2
Epoch rev: 01337
Checksum: 280

Satellite: GRO
Catalog number: 21225
Epoch time: 94056.01798028
Element set: 67
Inclination: 028.4620 deg
RA of node: 290.4640 deg
Eccentricity: 0.0003856
Arg of perigee: 037.8429 deg
Mean anomaly: 322.2943 deg
Mean motion: 15.40194914 rev/day
Decay rate: 4.590e-05 rev/day^2
Epoch rev: 03962
Checksum: 295

Satellite: UARS
Catalog number: 21701
Epoch time: 94050.07315151
Element set: 479
Inclination: 056.9834 deg
RA of node: 272.3681 deg
Eccentricity: 0.0002165
Arg of perigee: 100.1172 deg
Mean anomaly: 260.0857 deg
Mean motion: 14.96377326 rev/day
Decay rate: 3.162e-05 rev/day^2
Epoch rev: 13325
Checksum: 272

/EX

333. ORBS$063.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 13:46:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-063.n.1994@ampr.org>
Source record: 28087
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-063.N
2Line Orbital Elements 063.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SAT
FROM WA5QGD FORT WORTH,TX March 4, 1994
BID: $ORBS-063.N

DECODE 2-LINE ELSETS WIT
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058 B 94059.96429348 .00000264 00000-0 99999-4 0 2649
2 14129 027.2018 339.3804 6027104 158.3802 245.0891 02.05875835 80556
UO-11
1 14781U 84021B 94044.54889300 .00000363 00000-0 69607-4 0 6647
2 14781 97.7907 65.0254 0011279 310.7761 49.2455 14.69144313532150
RS-10/11
1 18129U 87054 A 94061.03883249 -.00000006 00000-0 00000 0 0 8773
2 18129 082.9217 048.0362 0011441 326.6023 033.4997 13.72331967335219
AO-13
1 19216U 88051 B 94060.48894014 .00000288 00000-0 14661-1 0 8882
2 19216 057.8304 265.6507 7212956 335.3196 002.8602 02.09730422 43757
FO-20
1 20480U 90013C 94046.42832899 -.00000014 00000-0 49346-4 0 6594
2 20480 99.0216 221.3367 0539917 255.4010 98.6634 12.83223845188515
AO-21
1 21087U 91006 A 94060.95526134 -.00000022 00000-0 00000 0 0 4391
2 21087 082.9416 222.0498 0035939 023.9104 336.4239 13.74533695154854
RS-12/13
1 21089U 91007A 94044.66379265 .00000043 00000-0 29527-4 0 6625
2 21089 82.9220 103.0678 0030946 91.8517 268.6203 13.74034946151682
ARSENE
1 22654U 93031B 93338.80803910 -.00000087 00000-0 00000 0 0 2437
2 22654 1.4104 113.5274 2936576 161.9838 210.8642 1.42202044 2990
UO-14
1 20437U 90005B 94046.18347456 .00000060 00000-0 40471-4 0 9649
2 20437 98.5953 132.5942 0010599 186.2827 173.8225 14.29823413212157
AO-16
1 20439U 90005D 94045.75388848 .00000076 00000-0 46533-4 0 7643
```

```
2 20439 98.6038 133.2765 0010934 188.0238 172.0765 14.29879034212109
DO-17
1 20440U 90005E 94045.23034447 .00000070 00000-0 44132-4 0 7637
2 20440 98.6058 133.0443 0010965 189.4352 170.6623 14.30017107212047
WO-18
1 20441U 90005F 94045.76328214 .00000059 00000-0 39826-4 0 7657
2 20441 98.6054 133.5798 0011505 188.3662 171.7330 14.29993172212124
LO-19
1 20442U 90005G 94045.74960276 .00000064 00000-0 41740-4 0 7638
2 20442 98.6048 133.7927 0011921 187.6862 172.4137 14.30087334212130
UO-22
1 21575U 91050B 94046.13690949 .00000113 00000-0 52716-4 0 4657
2 21575 98.4466 123.0432 0007219 301.1937 58.8542 14.36890610135556
KO-23
1 22077U 92052B 94046.40390865 -.00000037 00000-0 10000-3 0 3601
2 22077 66.0810 174.9628 0009874 317.5713 42.4539 12.86284764 71129
AO-27
1 22825U 93061C 94046.21545311 .00000058 00000-0 41460-4 0 2617
2 22825 98.6626 123.1936 0008062 202.2052 157.8775 14.27607193 20284
IO-26
1 22826U 93061D 94042.21058899 .00000053 00000-0 39268-4 0 2612
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
KO-25
1 22830U 93061H 94045.75293537 .00000053 00000-0 38624-4 0 2647
2 22830 98.5674 121.3071 0011406 172.0390 188.0975 14.28033386 20227
NOAA-9
1 15427U 84123 A 94061.01035146 -.00000010 00000-0 00000 0 0 7301
2 15427 099.0595 110.1740 0015036 161.5961 198.6262 14.13593205475201
NOAA-10
1 16969U 86073 A 94060.99970033 .00000206 00000-0 88281-4 0 6282
2 16969 098.5075 073.2639 0013002 284.1537 075.8728 14.24869344387340
MET-2/17
1 18820U 88005A 94046.33979358 .00000030 00000-0 12997-4 0 2628
2 18820 82.5401 5.5070 0016642 157.5160 202.6730 13.84706663305497
MET-3/2
1 19336U 88064A 94039.99790931 .00000051 00000-0 10000-3 0 2623
2 19336 82.5380 54.3969 0015730 222.0779 137.9138 13.16964807266383
NOAA-11
1 19531U 88089 A 94061.00386846 .00000354 00000-0 19022-3 0 5352
2 19531 099.1626 047.3332 0012104 074.4598 285.8484 14.12964394280081
MET-2/18
1 19851U 89018 A 94053.01405594 -.00000008 00000-0 00000 0 0 2631
2 19851 082.5171 235.7306 0014002 188.3029 171.8434 13.84356715251755
MET-3/3
1 20305U 89086 A 94052.02689974 .00000000 00000-0 99999-4 0 9894
2 20305 082.5516 350.2887 0006980 212.2401 147.8826 13.04401818207754
MET-2/19
1 20670U 90057A 94040.79306496 .00000024 00000-0 79036-5 0 7621
2 20670 82.5504 309.6649 0016176 139.0978 221.1403 13.84188455182995
FY-1/2
```

```
1 20788U 90081 A 94061.01586847 .00000377 00000-0 25065-3 0 9079
2 20788 098.8380 084.5670 0013935 308.8594 051.1838 14.01322350178699
MET-2/20
1 20826U 90086 A 94060.99109242 -.00000006 00000-0 00000 0 0 7776
2 20826 082.5222 231.2554 0013686 351.3644 008.7815 13.83573202172938
MET-3/4
1 21232U 91030A 94044.59202931 .00000051 00000-0 10000-3 0 6701
2 21232 82.5391 256.9674 0013673 130.9218 229.3059 13.16460015135098
NOAA-12
1 21263U 91032 A 94061.06053707 .00000214 00000-0 96445-4 0 9402
2 21263 098.6272 091.1459 0012968 186.5273 173.6274 14.22374247145306
MET-3/5
1 21655U 91056 A 94060.92535554 -.00000471 00000-0 99999-4 0 6828
2 21655 082.5586 192.4818 0013979 105.6381 254.6811 13.16827204122344
MET-2/21
1 22782U 93055 A 94061.07699856 .00000075 00000-0 68856-4 0 2771
2 22782 082.5414 291.3236 0022793 163.8377 196.4020 13.83001482025280
POSAT
1 22829U 93061G 94045.75585944 .00000072 00000-0 46760-4 0 2541
2 22829 98.6608 122.7699 0009759 191.0097 169.0872 14.28003980 20229
MIR
1 16609U 86017 A 94061.02012332 .00012762 00000-0 15107-3 0 1545
2 16609 051.6205 003.6927 0004649 015.8866 344.2953 15.60576251459339
HUBBLE
1 20580U 90037 B 94060.95287285 .00000486 00000-0 48620-4 0 4525
2 20580 028.4689 204.7466 0006400 049.7311 310.4334 14.90500352013379
GRO
1 21225U 91027 B 94056.01798028 .00004590 00000-0 11038-3 0 670
2 21225 028.4620 290.4640 0003856 037.8429 322.2943 15.40194914039629
UARS
1 21701U 91063 B 94050.07315151 .00003162 00000-0 27654-3 0 4793
2 21701 056.9834 272.3681 0002165 100.1172 260.0857 14.96377326133253
/EX
```

334. NASA pictures

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 15:28:24 UTC
From: jdoherty@uoguelph.ca
Message-ID: <2l7k2o$jvj@nermal.cs.uoguelph.ca>
Source record: 28088

Does anyone know where to find the satellite pictures of the moon, and
other things, that are currently being received from NASA's Clementine probe?
I heard on the news last night that these pics were available on the
Internet...

Please email: jdoherty@uoguelph.ca

Thanks,
John

335. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 18:34:14 UTC
From: wjc@ll.mit.edu
Message-ID: <1994Mar4.183414.15076@ll.mit.edu>
Source record: 28089
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

In article <jyoungberg.1.000B87CC@draper.com>, jyoungberg@draper.com (James W. Youngberg) writes:
|> I've followed various GPS threads as they've come and gone. In order to pose
|> volume/price arguments to folks in the business, what would be the size of the
|> amateur market for GPS engines?
|>
|> Presume an engine consists of the entire RX, minus antenna, including a data
|> port (probably NMEA 0183), on a PC board. Examples are currently manufacured
|> by Rockwell, Magellan, Canadian Marconi, Plessey, and Trimble, among others.
|> Marketed in the $500 class for single-unit quantities.
|>
|> Skip, K1NKR
|>

How many channels would I get for $500?

Bill Chiarchiaro N1CPK
wjc@ll.mit.edu

336. * SpaceNews 07-Mar-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 20:04:16 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0307.1994@ampr.org>
Source record: 28090
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0307
* SpaceNews 07-Mar-94 *

BID: $SPC0307

=========
SpaceNews
=========

MONDAY MARCH 7, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* AO-13 MODE S REPORT *
======================
With its new operating schedule, AO-13 is now seeing increased activity
during its Mode BS and S periods from users of the 2.4 GHz transponder.
With 4 hours available per orbit, listeners to the S band transmitter are
enjoying strong signals and noise free reception.

Antennas are mainly small dishes from 0.6m to 1m diameter although some
stations are successfully using loop Yagis. With a 1m dish on receive and
a single 19 element yagi on 435, good results can be achieved with 10 to 20
watts.

Stations having good signals on 2.4 GHz last week included:

N2IQU G0ONA ZS6JT VE3GTF JA7EC PT9FH OE6DGV TI5RLI VK6BMD

[Info via David, G0MRF]

* RS SAT
=====================
The following information is supplied by Andy, RK3KPK, the operator of RS3A,
the RS satellite command station:

RS10: Operating normally in Mode A: 145.860 -145.900 MHz uplink
29.360 - 29.400 MHz downlink
Autotransponder "Robot" ....145.820 MHz uplink
29.403 MHz downlink
Very good activity CW from DL,YO,G, HB - (swl RK3KPK),
Also it is possible to use special channel...145.850 MHz uplink
... 29.350 MHz downlink

RS12: Operating normally in Mode K: 21.210 - 21.250 MHz uplink
29.410 - 29.450 MHz downlink

Autotransponder "Robot" .....21.130 MHz uplink
... 29.454 MHz downlink

Please send QSL cards for "Robot" contacts to RK3KPK direct (SAE + I.R.C.):
Andrey Mironow, ul. V-Voloshinoj, d.11, kv.72
station Perlovskaya, 141014, Russia, CIS

or via DF4XW.

RS15: We are waiting for the launch of this satallite this spring.
The main frequencies of RS15 are:
Mode A: 145.857 - 145.897 MHz Uplink
29.357 - 29.397 MHz Downlink
Beacon 1: 29.398 MHz
Beacon 2: 29.351 (???) MHz
Power beacons low/high..... 0.4 - 1.2 Watt
Output of transponder ..... about 5 Watts
Inclination..... about 67 degrees
Height of orbit..... 2,300 Km
Weight of satellite..... about 50 Kg
Antenna..... dipoles
Memory of RS..... about 2 Kb

RK3KPK would like to hear about your DX contacts via the RS satellites.
For example, Andy had a DX contact with YV3... via RS6 in 1982!!! A QSL is
fine. Has anyone had better DX?

Comments to Andy should be directed via his packet radio address:
RK3KPK@RK3KP.RUS.EU or RK3KPK@RS3A.RUS.EU.

* DOVE OSCAR-17 NEWS *
======================
The DOVE spacecraft continues to transmit satellite telemetry and news items
using an AX.25 packet radio format. Shlomo, 4X4LF, in Israel provided the
following beacon reception:

DOVE-1>BRAMST [02/20/94 19:33:28] <UI>:
19th Feb 1994

DOVE reports have been received from :

KB4CYC KB5YVF KB7QLY KC1WD KC2SF
KC3H KC4ZRH KC6ROL KB2BD KD4GAR
KD4GHQ KD4SHL KD4UPF KD6NEW KI0G
KM6JV KMA1JL KR5J KX7L LA5VX

This will change in 3 Days

[vk7zbx]

Too bad they got my callsign wrong. :-)

* FO-20 SCHEDULE *
==================

The FO-20 command station announced that a slight malfunction in the onboard command system had been detected. As a result, analog mode operation arranged from 09-Feb-94 will be performed on schedule, but there is a possibility of interruption due to satellite ground station control.

The present schedule is as announced before:

Analog mode:
09-Mar-94 07:05 -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 -to- 30-Mar-94 08:15 UTC

Digital mode: Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
===========
Thanks to all those who sent QSL cards, letters, and messages of appreciation regarding SpaceNews, especially:

KC1CO N2SMP

* FEEDBACK/INPUT WELCOMED *
==========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

337. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-04 23:38:11 UTC
From: hunter@s07.es.llnl.gov
Message-ID: <2l8gp3$ikl@lll-winken.llnl.gov>
Source record: 28091
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

The Garmin GPS-10 receiver board is less than $350 in quantities of 2 (two). It is an 8-channel
receiver with NMEA output. They can supply a program that runs on a PC and displays the data
from the GPS-10, connected to one of the serial ports. The above price includes the antenna.
One of the reasons that we like it is that is only consumes 1 watt (0.2A @ 5V). Garmin can be
reached at (800)800-1020. Note that this is not an endorsement, etc., etc.....

Steven Hunter

338. Help with FCC Notification fpr SPACE operations ?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-05 06:21:07 UTC
From: ceham@w3eax.umd.edu
Message-ID: <2l98cj$aae@hecate.umd.edu>
Source record: 28092

Hi, I am trying to find out what exaclty is needed in terms
of an FCC notification for space operations.

We are currently developing an amateur radio experiment / payload
to fly for approximately 48 Hours in a low earth orbit
(space shuttle).

We tried contacting the FCC, but got the run around.
any info would be appreciated in terms of the
notification and STA (if required).

the experiment is basically based on packet radio, and GPS.
will use 2m.

Maurice
ceham@w3eax.umd.edu

339. v2l9331.zip - Hams: Converts raw OSV's to Two-Line Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-03-05 18:45:52 UTC
From: astroman@netcom.com
Message-ID: <9403051845.kp29579@SimTel.Coast.NET>
Source record: 28093
Cross-posted to: comp.archives.msdos.announce,rec.radio.info,rec.radio.amateur.space

I have uploaded to the SimTel Software Repository (available by anonymous ftp from the primary mirror site OAK.Oakland.Edu and its mirrors):

pub/msdos/hamradio/
v2l9331.zip Hams: Converts raw OSV's to Two-Line Elements

The Vector to Two-line Elements (VEC2TLE) software provides the user with the capability to convert position/velocity/time state vectors of a variety of formats to National Aeronautics and Space Administration (NASA) Compatible Two-Line Element (TLE) sets. These element sets contain orbit descriptions compatible for propagation with the Simplified General Perturbations (SGP) and SGP Version 4 (SGP4) orbit theories developed for use by the North American Aerospace Defense Command (NORAD) and United States Space Command (USSPACECOM).

TLEs have become an increasingly-popular source of orbital data. This is due mainly to the fact that this format of data is available for nearly all Earth-orbiting satellites. As a result, the popular satellite tracking software packages such as STSPLUS and TRAKSAT, use TLEs as their primary sources of input data along with the SGP4 orbit propagator.

TLE data is available for most Earth-orbiting satellites from several sources (see Appendix F). VEC2TLE is not intended to replace these as primary sources of TLE data. Rather, its primary purpose is for circumstances in which this data may not be available in a timely fashion. A prime example is the Space Transportation System (STS) where position and velocity state vectors may be the only orbital information available in near real time. In the past, users of the tracking software had little choice but to wait (hours) until the TLE data was available following thruster firings that changed the Shuttle's orbit. It is this situation that resulted in the creation of VEC2TLE. The TLEs computed by VEC2TLE are fully compatible with SGP or SGP4 as true and accurate renditions of the orbit specified by the input state vectors.

Uploaded on behalf of the author.

Michael Dabrowski KD6KMF
astroman@netcom.com

340. Re: v2l9331.zip - Hams: Converts raw OSV's to Two-Line Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-03-06 07:18:40 UTC
From: tcj@netcom.com
Message-ID: <tcjCM8Ez5.2sB@netcom.com>
Source record: 28094

Michael Dabrowski (astroman@netcom.com) writes:

> VEC2TLE is not intended to replace [the ususal] sources of TLE
> data. Rather, its primary purpose is for circumstances in which
> this data may not be available in a timely fashion. A prime example
> is the Space Transportation System (STS) where position and velocity
> state vectors may be the only orbital information available in near
> real time.

This sounds interesting, but there's one aspect I don't understand. Where does one obtain the state vectors? I don't recall ever having run across this type of data.

Todd, KB6JXT

341. ANS-064 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-03-06 20:22:35 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-064.01.1994@ampr.org>
Source record: 28095
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT
UOSAT-2 TURNS 10 YEARS OLD

HR AMSAT NEWS SERVICE BULLETIN 064.01 FROM AMSAT HQ
SILVER SPRING, MD MARCH 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-064.01

UOSAT-2 (UO-11) Celebrates 10 Years Of On-Orbit Service

At 17:59 UTC on March 1st, 1984, the second satellite designed and built by the University of Surrey, UoSAT-2 (UO-11) was launched on a Delta rocket from the Western Test Range at Vandenberg Air Force Base, California.

Among its many experiments, UoSAT-2 carried the Digital Communications Experiment, which was one of the first (if not THE first!) non-military use of store-and-forward techniques with Low Earth Orbiting satellites. UoSAT-2 was an early test-bed for many of the technologies that have since been incorporated into a number of other packet radio satellites.

For all those who wonder how long these satellites last, it should be noted that UoSAT-2 is still operational, ten years after launch!

Happy Birthday UoSAT-2 !!!

[The AMSAT News Service (ANS) would like to thank Eric Rosenberg (WD3Q) for the information contained in this bulletin item. Eric can be contacted at his INT

/EX
SB SAT
SAMPLE RS-15 KEPS

HR AMSAT NEWS SERVICE BULLETIN 064.02 FROM AMSAT HQ
SILVER SPRING, MD MARCH 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-064.02

KE3HP Presents A "Sample" Keplerian Element Set For RS-15

Based on information about RS-15's orbital paramaeters in last week's ANS bulletins, KE3HP has generated a set of predicted elements for this satel-lite. KE3HP assumed that the launch would be from Plesetsk at 12:00 UTC on 01-MAY-94. He generated these elements using OrbiTrack, an excellent MacIntosh shareware program by Bill Bard.

Satellite RS-15 predicted
Catalog Number 99999
Epoch 94 121.57362967 05/01/94 13:46:02 UTC
Drag2 0.00000000 Rev/Day^2
Inclination 67.0000 Deg
RAAN 22.8163 Deg
Eccentricity 0.0001152
Argument of Perigee 360.0000 Deg
Mean Anomaly 0.0000 Deg
Mean Motion 10.73887722 Rev/Day
Epoch Revolution 0

Semimajor Axis 8678.14 km
Precession 1.3232 Deg West/Day
Period 134.09 Min
Apogee 2301.00 KM 1429.77 SM 1242.44 NM
Perigee 2299.00 KM 1428.53 SM 1241.36 NM

The only element strongly influenced by the launch date and time will be RAAN. The primary difference is that these predicted elements will show the satellite passing over your QTH at a different time than when the real bird will. If you take these elements and "plug" them into your satellite tracking programs, one of the facinating features that you will discover about this orbit is that even on a low elevation pass (10 degs or less) RS-15 is visable for up to 20 minutes! This will make RS-15 an excellent satellite for Mode A operations. Please stay tuned to the AMSAT News Service (ANS) bulletins for further information about the launch of RS-15.

[The AMSAT News Service (ANS) would like to thank KE3HP for the information contained in this bulletin item.]

/EX
SB SAT
AO-13 OPERATIONS NET

HR AMSAT NEWS SERVICE BULLETIN 064.03 FROM AMSAT HQ
SILVER SPRING, MD MARCH 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-064.03

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

13-Mar-94 0130 B 075 VE2LVC W9ODI
19-Mar-94 1730 B 073 W5IU WA5ZIB
26-Mar-94 2130 B 084 WA5ZIB W5IU

Any stations with information on current events would be most welcome. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

AO-13 ZRO Tests For March 1994

The following schedule of Mode "B" tests were chosen for convenient operating times and favorable squint angles. The tests can be heard on 145.840 MHz. Andy McAlister (WA5ZIB) will conduct all the tests. Mode "JL" tests will no longer occur due to the failure of AO-13's 70CM transmitter.

Day Date (UTC) Time Areas covered

Saturday Mar. 19, 1994 1930 UTC NA, SA, Europe, Africa
Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC". Any changes will be announced as soon as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy MacAllister (WA5ZIB), AMSAT V.P. User Operations, 14714 Knights Way Drive, Houston, TX 77083-5640. A report will be returned verifying the level of accurate reception. An S.A.S.E. is appreciated but not required.

/EX
SB SAT
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 064.04 FROM AMSAT HQ
SILVER SPRING, MD MARCH 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-064.04

Weekly OSCAR Status Reports: 06-MAR-94

AO-13: Current Transponder Operating Schedule:
L QST
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
09-MAR-94 7:05 -TO- 16-MAR-94 7:30 UTC
23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC
DIGITAL MODE: Unless otherwise noted above.

[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

342. * G.R.A.P.S. *

Newsgroup: rec.radio.amateur.space
Date: 1994-03-06 23:41:58 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.N9Vsic1w165w@asarin.org.ar>
Source record: 28101

SB ALL @ AMSAT < LU3BDH $LU3AGJ20892
* G.R.A.P.S. *

I have the pleasure to announce that on March 1st was constituted the

"G.R.A.P.S" GRUPO RADIOAFICIONADOS ARGENTINO POR SATELITE.
ARGENTINE AMATEURS VIA SATELLITE GROUP.

The objectives of this group are strictly technical, in the developmentt, study and construction of satellite experiments, with the logic ambition that our "LUSAT-1" don't get held in history.

Unfortunately, our technicians lost the oportunity to applicate their knowhow and ambitions in the multi-national Phase-3D.

Our heading is to re-create the experiences of our "LUSAT-1", and others that may come from other countries, sharing the participation and looking forward for the major goal: another satellite!

I invite everyone that want to join the group actively. He/she will have a place, being a ham or not, being universities, technicians, engineers, schools, radio clubs, other institutions, etc.

From here now, we're going to publish bulletins only when a goal is done, as we don't want to create misunderstandings.

To date, the group have this members:

Engineers:
RAUL BON FOSTER, LU5ALG
JUAN CARLOS LUCIANI, LU4AGC
JULIO BIANCHI, LW1DUA
CLAUDIO MARCO ZANELLA, LU4AEY

Technicians:
NORBERTO PENINNI, LU8DYF (LUSAT-1 Control Station)
JUAN CLEMENTE, LU8ENU
OMAR CASTRO, LU5EO

Inventors:
EDUARDO SWEET BIRO, LU7AKC

Director:
MARIO IBERTIS RIVERA, LU2BDT

These ones will manage some experiment teams.

You can contact us via Internet, sending a message to

<graps@asarin.org.ar>

or via Packet radio, sending a PERSONAL message to

graps@lu7akc.#col.cf.arg.soam

or via Fax to

(+54-1) 552-1920 (ask for fax)

or via Voice phone to

(+54-1) 642-1664

NOTE: Please post this message over any net or list.

Sincerely yours, Eduardo Sweet Biro. (February 17, 1994)

343. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 04:47:08 UTC
From: rkarlqu@scd.hp.com
Message-ID: <2lebkc$kmk@hpscit.sc.hp.com>
Source record: 28096
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

The Motorola GPS receiver is less than $150 in 100's. It has six
channels and just about all the features you would ever want.

Rick Karlquist N6RK
rkarlqu@scd.hp.com

344. 2-Line Orbital Elements for Weather Satellites ($WEA-9403.07)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 05:11:58 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.NiBTic1w165w@asarin.org.ar>
Source record: 28097

```
SB KEPS @ AMSAT $WEA-9403.07
2-Line Orbital Elements WEA-9403.07
HR LU7AKC ORBITAL ELEMENTS FOR WEATHER SATELLITES
BID: $WEA-9403.07

DECODE THE 2-LINE ELEMENT SETS WITH
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

DMSP B5B-04
1 05557U 71087 A 94046.08810487 0.00000101 64466-4 0 5676
2 05557 99.1302 271.2998 0054691 41.4940 319.0370 14.23237080157605
DMSP B5C-06
1 06275U 72089 A 94043.58145448 0.00000113 69459-4 0 6656
2 06275 98.6254 259.9974 0037230 261.6379 98.0581 14.22810055101034
DMSP B5D1-3
1 10820U 78042 A 94046.03932775 0.00000177 87583-4 0 3646
2 10820 98.6551 237.5422 0009797 10.8342 349.3042 14.28777806821413
DMSP B5D2-1
1 13736U 82118 A 94047.02963511 0.00000091 38806-4 0 3498
2 13736 098.6319 238.7353 0008727 354.9829 005.1796 14.25611469579540
DMSP B5D2-2
1 14506U 83113 A 94043.48306532 0.00000124 72424-4 0 8665
2 14506 98.3695 219.2545 0011903 179.0920 181.0280 14.23714656531376
DMSP B5D2-3
1 18123U 87053 A 94048.04427424 -.00000196 00000-0 0 3125
2 18123 098.7855 241.5003 0014058 162.1766 198.0438 14.15334286344013
DMSP B5D2-4
1 18822U 88006 A 94048.03168228 -.00000006 00000-0 0 4168
2 18822 098.4546 267.8701 0006544 339.4454 020.6971 14.22927426313439
DMSP B5D2-5
1 20978U 90105 A 94048.08845942 0.00000231 82900-4 0 5169
2 20978 098.6983 111.3429 0079724 157.6860 202.8333 14.32373273167914
DMSP B5D2-6
1 21798U 91082 A 94048.06239186 0.00000160 85084-4 0 1758
2 21798 098.9625 053.6274 0013310 119.4953 240.8130 14.13765141114642
GOES 2 R
1 10062U 77048 B 94044.91764046 0.00000181 25789-4 0 3676
2 10062 28.4191 2.3423 0761928 193.3964 164.5242 13.30796042807866
GOES 3 R
1 07735U 75027 B 94047.96577140 0.00000127 57362-4 0 3682
```

```
2 07735 114.9817 056.7234 0040715 192.4938 167.5052 14.21823840977478
GOES 6 R
1 14051U 83041 B 94045.17695222 0.00001914 20866-3 0 4885
2 14051 25.3429 352.7455 1352659 163.1101 201.9315 12.50792293485270
OKEAN 1
1 19274U 88056 A 94047.89924351 0.00000169 21204-4 0 8644
2 19274 082.5168 348.1892 0020890 047.4068 312.9544 14.82089035303260
OKEAN 1 R
1 19275U 88056 B 94045.85612777 0.00000252 32030-4 0 2629
2 19275 82.5170 358.4007 0023949 81.6804 278.7120 14.77324394302422
OKEAN 2
1 20510U 90018 A 94047.76877289 0.00000274 37783-4 0 2654
2 20510 082.5244 296.6799 0018240 222.0501 137.9960 14.78256509213873
OKEAN 2 R
1 20511U 90018 B 94040.18173672 0.00000159 20334-4 0 8639
2 20511 82.5266 307.6777 0017361 265.5410 94.3826 14.75088343212491
OKEAN 3
1 21397U 91039 A 94047.97346102 0.00000583 84183-4 0 9667
2 21397 082.5233 208.0021 0022170 292.7507 067.1947 14.76123763145772
OKEAN 3 D
1 21842U 91039 C 94045.84090004 0.00001263 16230-3 0 5651
2 21842 82.5239 206.1257 0020227 288.0675 71.8331 14.80306886145726
OKEAN 3 R
1 21398U 91039 B 94046.46287310 0.00000188 24614-4 0 6656
2 21398 82.5238 210.6962 0022507 306.4452 53.4677 14.74895009145479
TIROS 2
1 00063U 600PI1 94043.56348375 0.00000778 88819-4 0 4621
2 00063 48.5252 224.5938 0045749 248.3930 111.2115 14.96402064790822
TIROS 10 D
1 01440U 65051C 94044.63529445 0.00030785 48911-3 0 5292
2 01440 98.5290 290.2793 0023036 122.5668 237.7879 15.52987427536715
TIROS N
1 11060U 78096 A 94044.70090970 0.00000031 37948-4 0 8651
2 11060 98.6771 101.9352 0010101 261.4638 98.5392 14.15589441 5768
NOAA-9
1 15427U 84123 A 94061.01035146 -.00000010 00000-0 00000 0 0 7301
2 15427 099.0595 110.1740 0015036 161.5961 198.6262 14.13593205475201
NOAA-10
1 16969U 86073 A 94060.99970033 .00000206 00000-0 88281-4 0 6282
2 16969 098.5075 073.2639 0013002 284.1537 075.8728 14.24869344387340
MET-2/17
1 18820U 88005A 94046.33979358 .00000030 00000-0 12997-4 0 2628
2 18820 82.5401 5.5070 0016642 157.5160 202.6730 13.84706663305497
MET-3/2
1 19336U 88064A 94039.99790931 .00000051 00000-0 10000-3 0 2623
2 19336 82.5380 54.3969 0015730 222.0779 137.9138 13.16964807266383
NOAA-11
1 19531U 88089 A 94061.00386846 .00000354 00000-0 19022-3 0 5352
2 19531 099.1626 047.3332 0012104 074.4598 285.8484 14.12964394280081
MET-2/18
```

```
1 19851U 89018 A 94053.01405594 -.00000008 00000-0 00000 0 0 2631
2 19851 082.5171 235.7306 0014002 188.3029 171.8434 13.84356715251755
MET-3/3
1 20305U 89086 A 94052.02689974 .00000000 00000-0 99999-4 0 9894
2 20305 082.5516 350.2887 0006980 212.2401 147.8826 13.04401818207754
MET-2/19
1 20670U 90057A 94040.79306496 .00000024 00000-0 79036-5 0 7621
2 20670 82.5504 309.6649 0016176 139.0978 221.1403 13.84188455182995
FY-1/2
1 20788U 90081 A 94061.01586847 .00000377 00000-0 25065-3 0 9079
2 20788 098.8380 084.5670 0013935 308.8594 051.1838 14.01322350178699
MET-2/20
1 20826U 90086 A 94060.99109242 -.00000006 00000-0 00000 0 0 7776
2 20826 082.5222 231.2554 0013686 351.3644 008.7815 13.83573202172938
MET-3/4
1 21232U 91030A 94044.59202931 .00000051 00000-0 10000-3 0 6701
2 21232 82.5391 256.9674 0013673 130.9218 229.3059 13.16460015135098
NOAA-12
1 21263U 91032 A 94061.06053707 .00000214 00000-0 96445-4 0 9402
2 21263 098.6272 091.1459 0012968 186.5273 173.6274 14.22374247145306
MET-3/5
1 21655U 91056 A 94060.92535554 -.00000471 00000-0 99999-4 0 6828
2 21655 082.5586 192.4818 0013979 105.6381 254.6811 13.16827204122344
MET-2/21
1 22782U 93055 A 94061.07699856 .00000075 00000-0 68856-4 0 2771
2 22782 082.5414 291.3236 0022793 163.8377 196.4020 13.83001482025280
/EX
```

345. APT-Satellites: Report MAR 05, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 10:36:51 UTC
From: peter.henne@gmd.de
Message-ID: <1994Mar7.103651.29617@gmd.de>
Source record: 28098
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, MAR 05, 1994

NOAA-9: APT 137.62 *OFF*
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.40 *OFF*
Meteor 3-3: APT *OFF*
Meteor 3-5: APT 137.85 ON again
Meteor 3-6: APT 137.30 *OFF*

NOAA-9 is off due to VHF-conflict with NOAA-11 until
April 09, NOAA-10 is off due to VHF-conflict with NOAA-12
until March 13 (info from wxsat-mail-list (TBUS)).
Meteor 2-21 is off now, notice frequency-change from
137.85 to 137.40 MHz. Meteor 3-5 is active again, now
on 137.85 MHz, transmitting very good vis-images.
```


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

346. Shuttle Retransmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 11:43:00 UTC
From: stocker@nssdca.gsfc.nasa.gov
Message-ID: <7MAR199407434590@nssdca.gsfc.nasa.gov>
Source record: 28105

As you may know GARC volunteers undertake to retransmit Shuttle Ground transmissions. Please note the following:

INTERESTED IN SHUTTLE TRANSMISSIONS
The Goddard Amateur Radio Club (GARC)invites interested people to tune in to Shuttle transmissions. As a public service to the Amateur radio community, the GARC retransmits space shuttle air-to-ground communications. During the STS-62 mission, Amateur radio operators, shortwave listeners, and those individuals with scanners can listen to these communications on the following HF (single side band) and VHF frequencies:

3.860 MHz (lower sideband)
7.185 MHz (lower sideband)
14.295 MHz (upper sideband)
21.395 Mhz (upper sideband)
28.650 Mhz (upper sideband)

and

147.45 Mhz (FM) Local DC Metro Area

73 de N3OXM

GARC PI Coordinator

347. Re: Satellite FAQ answers (long)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 13:03:38 UTC
From: sgreene@access1.digex.net
Message-ID: <2lf8na$a74@access1.digex.net>
Source record: 28099

An addition to Stephen's amateur satellite FAQ: AMRAD-OSCAR 27 (AO-27) downlink is 436.8 MHZ (actually, its closer to 436.7975), not 436.9. Operating mode is presently analog FM voice at either 0.5W or 2 W downlink transmit power. Uplink is 145.85 MHz, analog FM voice. The satellite is in a schedule placing the amateur payload in use during daytime passes over the Northern Hemisphere. Note that this schedule can change WQxx WITHOUT NOTICE based on the requirements of the "host" commercial EYESAT satellite's mission.

BTW, I've copied the article, and plan to use it for a satellite beginner's forum we'll be holding in the Washington Area next month. And I'm glad that summary I posted back in '93xxx '92 was useful!

73, Steve Greene, ka1lm@amsat.0xxxxxxxxxxxxxxx
ka1lm@amsat.org / sgreene@access.digex.net

(One of thes'e days, I'll get a decent offline mailer!)

348. Re: Mir

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 15:35:07 UTC
From: dtiller@cscsun.rmc.edu
Message-ID: <CMAwMK.HC8@cscsun.rmc.edu>
Source record: 28100

Troyce (Troyce@bio.tamu.edu) wrote:
: According to the latest orbital data, the Mir should be orbiting almost
: directly overhead of me late Friday morning and only about 389 km in
: distance. Would I have any real chance of picking them up (if they're
: transmitting) using only a HT, or would I need a base rig and satellite
: antenna?

An HT should do the trick. I've heard MIR, DO-17, and STS-xx on my HT.
I even talked to the STS folk while I was watching them from the ground.
I told them that they'd just gone into the earth's shadow, and they wondered
how I knew. I told them that they make a pretty bright 'star' as they zip
along, and that I just saw them wink out!
--
David Tiller | Network Administrator | Voice: (804) 752-3710 |
dtiller@rmc.edu | Randolph-Macon College| Fax: (804) 752-7231 |
"Drunk, [Beowulf] slew | P.O. Box 5005 | ICBM: 37d 42' 43.75" N |
no hearth companions." | Ashland, Va 23005 | 77d 31' 32.19" W |

349. STS-62 Element Set (94066.147)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-07 17:45:58 UTC
From: elements-request@alsys.com
Message-ID: <STS-62.94066.147@alsys.com>
Source record: 28102
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-62
1 23025U 94015A 94066.14730123 +.00010676 53415-5 38715-4 0 78
2 23025 39.0156 232.0339 0006278 300.7024 59.3165 15.90383526 426

Satellite: STS-62
Catalog number: 23025
Epoch time: 94066.14730123 (07 MAR 94 03:32:06.83 UTC)
Element set: GSFC-007
Inclination: 39.0156 deg
RA of node: 232.0339 deg Space Shuttle Flight STS-62
Eccentricity: 0.0006278 Keplerian Elements
Arg of perigee: 300.7024 deg
Mean anomaly: 59.3165 deg
Mean motion: 15.90383526 rev/day Semi-major Axis: 6679.3410 Km
Decay rate: 0.11E-03 rev/day*2 Apogee Alt: 305.15 Km
Epoch rev: 42 Perigee Alt: 296.76 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris KK6YB Internet: elements-request@alsys.com
San Diego, CA, USA Phone: +1 619-457-2700
```

350. Two-Line Orbital Element Sets (TLE353)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-08 01:55:07 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.763091707@afit.af.mil>
Source record: 28103

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #353 -
Alouette 1
1 00424U 62049 94062.94070867 .00000040 00000-0 36701-4 0 9730
2 00424 80.4616 28.8384 0024084 28.6462 331.6001 13.67799863568019
ATS 3
1 03029U 67111A 94063.16478810 -.00000126 00000-0 10000-3 0 1678
2 03029 14.5857 8.5628 0009691 269.5226 197.5858 1.00272966 96384
Cosmos 398
1 04966U 71016A 94066.27503916 .00119591 71728-5 26679-3 0 460
2 04966 51.4489 3.9716 1129787 66.5247 305.0262 13.63793992758706
Starlette
1 07646U 75010A 94063.31445557 -.00000154 00000-0 -83090-5 0 7616
2 07646 49.8261 207.1974 0205797 349.8416 9.8352 13.82185531963349
LAGEOS
1 08820U 76039A 94063.18928398 .00000021 00000-0 10000-3 0 9732
2 08820 109.8356 99.6405 0044292 307.8682 51.8037 6.38664429160447
ETS-2
1 09852U 77014A 94065.59612416 -.00000218 00000-0 10000-3 0 9571
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Cosmos 1447
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Meteor 2-16
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AO-13
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Akebono
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Kvant-2
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2 21576 98.4463 120.5362 0003479 321.1408 38.9534 14.36281391135276
TUBSAT-A
1 21577U 91050D 94045.22168760 .00000046 00000-0 30498-4 0 4635
2 21577 98.4430 121.5302 0006069 307.5276 52.5356 14.36421982135383
SARA
1 21578U 91050 E 94061.77012941 .00000300 00000-0 98186-4 0 6669
2 21578 098.4497 140.5306 0004810 249.6674 110.4566 14.38692003137905
TDRS 4
1 21639U 91054B 94063.59188987 .00000062 00000-0 10000-3 0 7010
2 21639 0.0482 103.3448 0002451 278.9710 178.5561 1.00274586 7526
Meteor 3-5
1 21655U 91056 A 94062.90084359 -.00000841 00000-0 99999-4 0 6843
2 21655 082.5574 191.0866 0014109 101.8205 258.5019 13.16823125122608
UARS
1 21701U 91063 B 94050.07315151 .00003162 00000-0 27654-3 0 4793
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2 21701 056.9834 272.3681 0002165 100.1172 260.0857 14.96377326133253
DMSP B5D2-6
1 21798U 91082A 94065.89699836 .00000153 00000-0 10466-3 0 1990
2 21798 98.9643 71.5043 0014060 69.0279 291.2395 14.13771923117167
Glonass 53
1 21853U 92005A 94044.71092472 .00000009 00000-0 10000-3 0 8686
2 21853 64.8687 113.2801 0006649 202.0274 158.0161 2.13102140 15910
Glonass 54
1 21854U 92005B 94065.65079666 .00000016 00000-0 00000+0 0 9317
2 21854 64.8786 112.5406 0015926 10.9081 349.1958 2.13102927 16342
Glonass 55
1 21855U 92005C 94063.36525422 .00000003 00000-0 00000+0 0 9282
2 21855 64.8842 112.6258 0007577 220.5741 139.4383 2.13101947 16283
JERS-1
1 21867U 92007A 94066.19796594 .00001737 00000-0 14937-3 0 2478
2 21867 97.6515 142.9844 0000831 62.7037 297.4271 14.98676778113109
GPS BIIA-12
1 21890U 92009A 94065.56395787 .00000025 00000-0 10000-3 0 4800
2 21890 54.1995 260.9799 0056409 161.0258 199.1956 2.00552087 14929
GPS BIIA-13
1 21930U 92019A 94065.27296672 -.00000071 00000-0 10000-3 0 4719
2 21930 55.5655 21.9565 0053163 169.5506 190.5566 2.00563273 13842
EUVE
1 21987U 92031 A 94060.02973769 .00002607 00000-0 12359-3 0 2726
2 21987 028.4330 059.4260 0010285 231.1733 128.8380 15.18216364095945
SAMPEX
1 22012U 92038A 94065.54032451 .00001561 00000-0 13569-3 0 4969
2 22012 81.6695 279.1446 0120370 15.3544 345.1204 14.90871059 90981
GPS BIIA-14
1 22014U 92039A 94063.31065700 .00000020 00000-0 10000-3 0 3783
2 22014 54.8978 201.9285 0082935 297.4349 61.6768 2.00566105 5648
Glonass 56
1 22056U 92047 A 94062.79663307 .00000000 00000-0 99999-4 0 8245
2 22056 064.9389 352.5630 0006326 283.6605 076.3055 02.13102667012374
Glonass 57
1 22057U 92047 B 94062.15208447 .00000000 00000-0 99999-4 0 8280
2 22057 064.9544 352.5975 0009251 320.6226 039.3466 02.13102059012326
Glonass 58
1 22058U 92047 C 94062.56227298 .00000000 00000-0 99999-4 0 8416
2 22058 064.9514 352.5849 0010757 284.4520 075.4651 02.13102538012386
TOPEX
1 22076U 92052A 94045.06985646 -.00000038 00000-0 10000-3 0 7265
2 22076 66.0392 186.7277 0007642 266.4013 93.6070 12.80929690 70721
KO-23
1 22077U 92052B 94046.40390865 -.00000037 00000-0 10000-3 0 3601
2 22077 66.0810 174.9628 0009874 317.5713 42.4539 12.86284764 71129
S80/T
1 22078U 92052C 94045.42799786 -.00000037 00000-0 10000-3 0 3596
2 22078 66.0806 176.4196 0011233 320.9886 39.0312 12.86566391 71066
GPS BIIA-15
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1 22108U 92058A 94065.76631478 .00000024 00000-0 10000-3 0 3751
2 22108 54.4046 261.6574 0107065 135.8299 225.0163 2.00568713 10872
FREJA
1 22161U 92064 A 94062.83212058 .00000373 00000-0 17100-3 0 3802
2 22161 063.0004 199.1952 0780767 305.8673 047.2809 13.21730275067879
LAGEOS II
1 22195U 92070B 94043.79549654 -.00000009 00000-0 10000-3 0 2634
2 22195 52.6424 172.2993 0138578 63.1567 298.3090 6.47294107 30898
GPS BIIA-16
1 22231U 92079 A 94057.48029576 .00000026 00000-0 99999-4 0 3736
2 22231 054.7240 203.3952 0037374 293.8607 065.7814 02.00561849009293
GPS BIIA-17
1 22275U 92089 A 94056.12787197 -.00000009 00000-0 99999-4 0 3793
2 22275 054.6661 200.9884 0051896 255.6293 103.8275 02.00558030008669
TDRS 5
1 22314U 93003 B 94059.88979974 .00000000 00000-0 99999-4 0 3741
2 22314 000.8301 073.2583 0002342 271.9868 087.9876 01.00276571004251
GPS BIIA-18
1 22446U 93007A 94065.67819251 -.00000080 00000-0 10000-3 0 3728
2 22446 54.7395 321.4969 0073498 42.0051 318.5837 2.00583765 7884
Glonass 59
1 22512U 93010A 94065.82826895 .00000018 00000-0 00000+0 0 5306
2 22512 64.8946 112.3900 0009309 206.4372 153.5856 2.13101901 7932
Glonass 60
1 22513U 93010B 94063.42242398 .00000004 00000-0 00000+0 0 5463
2 22513 64.8925 112.4935 0007765 206.3310 153.6963 2.13102577 8070
Glonass 61
1 22514U 93010C 94065.06586962 .00000011 00000-0 00000+0 0 5260
2 22514 64.9025 112.4208 0014358 197.2535 162.7650 2.13101390 8110
ASTRO-D
1 22521U 93011 A 94060.06163904 .00002285 00000-0 20278-3 0 2682
2 22521 031.1004 034.9646 0075997 116.0666 244.8291 14.93027232055922
UFO F1
1 22563U 93015 A 94059.54643604 .00000000 00000-0 99999-4 0 2616
2 22563 026.9496 301.5503 0007069 329.2291 030.7419 00.99246868007769
GPS BIIA-19
1 22581U 93017 A 94059.83228738 -.00000035 00000-0 99999-4 0 2762
2 22581 055.0363 021.9601 0045500 031.4428 328.8618 02.00570579006790
ProgressM17
1 22588U 93019 A 94062.01235621 .09281884 00000-0 93180-4 0 5584
2 22588 051.6176 326.2403 0015344 306.1847 053.8452 16.49705738052902
ARSENE
1 22654U 93031B 94064.50000000 -.00000119 00000-0 00000+0 0 2469
2 22654 1.6510 105.2680 2927552 173.8780 198.1380 1.42201225 2991
GPS BIIA-20
1 22657U 93032 A 94060.96145370 -.00000041 00000-0 99999-4 0 2766
2 22657 055.1092 021.7221 0061362 206.5966 153.1210 02.00560176002139
GPS BIIA-21
1 22700U 93042A 94065.41482035 .00000025 00000-0 10000-3 0 2758
2 22700 54.5856 262.3929 0026041 319.7508 40.0756 2.00573867 5022
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NOAA 13
1 22739U 93050A 94065.95512567 .00000079 00000-0 69052-4 0 3451
2 22739 98.9365 10.7985 0011042 51.1715 309.0438 14.10883748 29544
GPS BIIA-22
1 22779U 93054A 94065.00824289 -.00000080 00000-0 10000-3 0 2957
2 22779 54.8405 321.4418 0023881 232.1234 127.6708 2.00564406 3772
Meteor 2-21
1 22782U 93055 A 94063.10272397 .00000035 00000-0 32090-4 0 2793
2 22782 082.5447 289.7157 0022496 158.4855 201.7772 13.83001813025563
UFO F2
1 22787U 93056A 94039.80432810 -.00000164 00000-0 10000-3 0 2595
2 22787 4.9483 323.2951 0108765 43.9126 134.3514 1.00291295 508
SPOT 3
1 22823U 93061 A 94052.73702378 -.00000033 00000-0 00000+0 0 2734
2 22823 098.7236 128.9180 0000713 131.4275 228.7508 14.20023459021103
STELLA
1 22824U 93061B 94045.21355068 -.00000018 00000-0 10571-4 0 2619
2 22824 98.6631 122.1489 0005580 202.3743 157.7190 14.27095054 20132
AO-27
1 22825U 93061C 94046.21545311 .00000058 00000-0 41460-4 0 2617
2 22825 98.6626 123.1936 0008062 202.2052 157.8775 14.27607193 20284
IO-26
1 22826U 93061D 94042.21058899 .00000053 00000-0 39268-4 0 2612
2 22826 98.6649 119.2441 0008529 216.1988 143.8612 14.27708814 19710
HEATHSAT
1 22827U 93061E 94042.20074436 .00000066 00000-0 44578-4 0 3230
2 22827 98.6630 119.2172 0008654 203.2830 156.7954 14.27813763 19716
PO-28
1 22829U 93061G 94045.75585944 .00000072 00000-0 46760-4 0 2541
2 22829 98.6608 122.7699 0009759 191.0097 169.0872 14.28003980 20229
KO-25
1 22830U 93061H 94045.75293537 .00000053 00000-0 38624-4 0 2647
2 22830 98.5674 121.3071 0011406 172.0390 188.0975 14.28033386 20227
GPS BIIA-23
1 22877U 93068 A 94063.06825856 .00000066 00000-0 99999-4 0 851
2 22877 055.1170 082.6813 0032596 282.7519 076.9175 02.00554208002625
METEOSAT 6
1 22912U 93073 B 94056.34260230 .00000000 00000-0 99999-4 0 701
2 22912 001.1402 268.0925 0001838 355.3369 004.6653 01.00269672000087
HST Array
1 22920U 90037C 94063.47096687 .00012086 00000-0 10572-2 0 954
2 22920 28.4632 185.1914 0004543 258.9601 101.0345 14.95287961 13794
Soyuz TM-18
1 22957U 94001A 94066.14275639 .00016197 00000-0 19678-3 0 574
2 22957 51.6187 337.8994 0004231 49.8217 310.4662 15.60732293 9053
Meteor 3-6
1 22969U 94003 A 94062.69257899 .00000004 00000-0 99999-4 0 365
2 22969 082.5622 130.6975 0016135 165.3815 194.8279 13.16718337004960
TUBSAT-B
1 22970U 94003 B 94058.89047368 .00000004 00000-0 99999-4 0 249
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2 22970 082.5652 133.3758 0014960 174.5086 185.6757 13.16823129004460
ProgressM21
1 22975U 94005A 94066.14275639 .00016197 00000-0 19678-3 0 466
2 22975 51.6187 337.8994 0004231 49.8217 310.4662 15.60732293 5958
VEP
1 22979U 94007B 94065.94243130 -.00000193 00000-0 41908-3 0 236
2 22979 28.6066 149.9513 7216483 178.4551 186.6004 2.24303517 702
Raduga 1-3
1 22981U 94008A 94064.89047317 .00000088 00000-0 00000+0 0 362
2 22981 1.4553 274.8212 0002599 202.7910 55.7635 1.00284653 82
1994008D
1 22984U 94008D 94061.44590041 -.00000036 00000-0 10000-3 0 145
2 22984 1.4967 274.5453 0019051 302.6551 346.7363 0.97966529 131
1994008E
1 22985U 94008E 94065.60360884 .00002678 00000-0 12624-2 0 177
2 22985 47.3354 268.0367 7313425 7.5555 359.2675 2.22761390 669
1994008F
1 22986U 94008F 94065.65325238 .00000512 00000-0 52034-3 0 150
2 22986 47.3737 268.1365 7295754 7.4454 359.2460 2.22344158 644
ODERACS A
1 22990U 94006B 94064.46101997 .00057376 00000-0 34685-3 0 214
2 22990 56.9908 80.8776 0016835 332.8249 27.1927 15.76960242 3745
ODERACS B
1 22991U 94006C 94065.10173117 .00056288 00000-0 34587-3 0 212
2 22991 56.9879 78.0522 0017023 339.7902 20.2484 15.76594013 3845
ODERACS E
1 22994U 94006F 94066.00774086 .00028284 00000-0 18923-3 0 241
2 22994 56.9881 74.1419 0015199 342.6151 17.4379 15.75013178 3987
ODERACS F
1 22995U 94006G 94066.00916033 .00029159 00000-0 19545-3 0 256
2 22995 56.9861 74.1520 0015459 344.1469 15.9076 15.74946917 3989
SJ 4
1 22996U 94010A 94065.64988060 .00005717 87953-7 28766-3 0 135
2 22996 28.5464 246.6284 7326212 195.3789 116.2840 2.25868117 424
1994010B
1 22997U 94010B 94065.63132807 .00013377 10347-6 93994-3 0 155
2 22997 27.7009 246.6453 7319300 195.4085 116.4253 2.26207748 427
BREMSAT
1 22998U 94006H 94066.21875833 .00030322 00000-0 21359-3 0 85
2 22998 56.9890 73.4061 0013343 3.6462 356.4616 15.73815090 3862
Cosmos 2268
1 22999U 94011 A 94063.03208090 .00000000 00000-0 99999-4 0 248
2 22999 082.5753 290.0856 0008790 232.3998 127.6748 12.60997471002488
Cosmos 2269
1 23000U 94011 B 94052.07774509 -.00000164 00000-0 99999-4 0 69
2 23000 082.5683 297.0399 0007010 286.4409 073.6364 12.61749401001105
Cosmos 2270
1 23001U 94011C 94065.85934787 -.00000060 00000-0 -39402-3 0 187
2 23001 82.5730 288.2394 0005999 308.8577 51.1960 12.62628889 2847
Cosmos 2271
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1 23002U 94011D 94064.58122894 .00000019 00000-0 47769-4 0 116
2 23002 82.5613 289.0166 0008825 326.8468 33.2070 12.63243103 2682
Cosmos 2272
1 23003U 94011 E 94052.06139672 -.00000055 00000-0 99999-4 0 44
2 23003 082.5723 297.0309 0013721 358.7945 001.3565 12.64137974001096
Cosmos 2273
1 23004U 94011 F 94057.06379685 -.00000031 00000-0 99999-4 0 167
2 23004 082.5743 293.8548 0006394 324.7147 035.3974 12.62629294001734
1994011G
1 23005U 94011 G 94054.03663295 -.00000024 00000-0 99999-4 0 55
2 23005 082.5787 295.8869 0040830 221.9237 137.9174 12.55112617001337
1994010C
1 23009U 94010C 94065.61408508 .00014381 10322-6 78073-3 0 130
2 23009 28.5314 246.7717 7321212 195.3145 116.5132 2.26386848 421
Raduga 31
1 23010U 94012A 94065.81585541 .00000105 00000-0 00000+0 0 304
2 23010 1.4165 276.0287 0011314 112.2940 114.7104 1.00292395 139
1994012D
1 23013U 94012D 94060.86256550 -.00000182 00000-0 00000+0 0 49
2 23013 1.4985 276.5031 0030054 346.1874 208.0069 0.98106995 100
1994012E
1 23014U 94012E 94060.60785433 .00000072 00000-0 10000-3 0 85
2 23014 47.3967 273.1890 7311509 2.7403 359.8000 2.22741905 265
1994012F
1 23015U 94012F 94065.57341993 .00000108 00000-0 10000-3 0 109
2 23015 47.4213 271.9158 7294651 3.9260 359.6764 2.22358889 378
Galaxy 1R
1 23016U 94013 A 94063.27028139 .00000000 00000-0 99999-4 0 50
2 23016 000.0370 126.2086 0013998 218.0898 141.7973 01.00282688000013
1994013B
1 23017U 94013B 94066.04464571 .01571702 -60939-5 48210-3 0 294
2 23017 26.5589 252.2693 1658999 274.7091 66.7378 12.56175224 1863
1994013C
1 23018U 94013 C 94062.90450632 .00000000 00000-0 99999-4 0 81
2 23018 025.6039 318.5059 6495063 003.2157 359.4982 02.02376783000247
1994014A
1 23019U 94014 A 94063.10706371 .00006126 00000-0 28706-3 0 71
2 23019 082.4878 235.7880 0029290 238.8496 121.0523 15.19329863000291
1994014B
1 23020U 94014B 94065.47111488 .00026851 00000-0 11692-2 0 122
2 23020 82.4871 233.4083 0021237 286.3814 73.5006 15.21878791 650
1994014C
1 23021U 94014C 94065.90712755 .00042680 00000-0 14593-2 0 126
2 23021 82.4913 232.9408 0022358 105.4296 254.9357 15.29839725 738
1994014D
1 23022U 94014D 94065.87357575 .00002896 00000-0 13461-3 0 48
2 23022 82.4894 233.0350 0028703 228.0093 131.8697 15.19217296 510
1994014E
1 23023U 94014E 94065.48508398 .00025934 00000-0 12672-2 0 47
2 23023 82.4873 233.4422 0050477 207.2542 152.5993 15.16967851 653
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1994014F
1 23024U 94014F 94064.88269131 .00025368 00000-0 11475-2 0 52
2 23024 82.4760 233.8944 0025125 224.3899 135.5310 15.20497976 575
STS 62
1 23025U 94015A 94066.25000000 .00000887 52937-5 80286-5 0 87
2 23025 39.0180 231.3591 0006533 300.5042 288.3809 15.90376542 426
1994014G
1 23026U 94014G 94065.48016506 .00019518 00000-0 92695-3 0 51
2 23026 82.5037 233.5698 0031576 235.9405 123.8816 15.18667106 657
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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351. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-08 05:21:31 UTC
From: jlw3@cec3.wustl.edu
Message-ID: <2lh20r$auf@bigfoot.wustl.edu>
Source record: 28104
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

Richard Karlquist (rkarlqu@scd.hp.com) wrote:
: The Motorola GPS receiver is less than $150 in 100's. It has six
: channels and just about all the features you would ever want.

: Rick Karlquist N6RK
: rkarlqu@scd.hp.com

The question is: who's going to be buying in 100's?

352. GPS Recievers and Differential GPS

Newsgroup: rec.radio.amateur.space
Date: 1994-03-08 14:47:54 UTC
From: zawodny@arbd0.larc.nasa.gov
Message-ID: <2li36q$9kd@reznor.larc.nasa.gov>
Source record: 28106

This may be a posting in search of the proper place to be posted.
Scanning the list, several groups seemed likely places to start.

I need to know a bit more about GPS. What sort of spatial resoultion
can I expect from a hand held GPS receiver? I am not asking about accuracy
(knowing exactly where I am), but rather about how far I have to move before
the GPS can tell me that I have moved. Is 10 or 20 feet obtainable with
handheld equipment? I've been using Loran-C with 0.01 arc minute display
resoultion and it just isn't enough for my needs. Do any of the hand held GPS
units have an extra digit (0.001 arc minute or 0.1 arc second)?

I know that very high precision (centemeters) is possible using the GPS
in a differential mode? Is this an easy arrangement to set up? How is it
done? Any references to the published literature are welcomed.

Finally, do you have any recommendations, either pro or con, on buying
a hand held GPS receiver?

TIA,

--
Joseph M. Zawodny (KO4LW) NASA Langley Research Center
Internet: zawodny@arbd0.larc.nasa.gov MS-475, Hampton VA, 23681-0001
Packet: ko4lw@n4hog.va.usa

353. Amateur Satellite Information?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-08 22:39:35 UTC
From: zawada@softage.demon.co.uk
Message-ID: <CMDAxz.2H1@demon.co.uk>
Source record: 28107
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.space,uk.radio.amateur,sci.space

I'm looking for information on receiving packet radio satellites on VHF.
I've got a packet radio decoder and VHF receiver, what I need is....

Name Of Satellite
Frequency
Type of transmission (aerial type)

Any information would be greatly appreciated.

Thanks

Mark
--

Mark Simpson

354. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-03-08 22:43:33 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.763166613@afit.af.mil>
Source record: 28108

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 62
1 23025U 94015A 94066.58333333 .00024132 55158-5 80902-4 0 93
2 23025 39.0151 229.1553 0006237 299.8055 40.4124 15.90381391 472
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

355. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-03-08 22:43:50 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.763166630@afit.af.mil>
Source record: 28109
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 62
1 23025U 94015A 94066.58333333 .00024132 55158-5 80902-4 0 93
2 23025 39.0151 229.1553 0006237 299.8055 40.4124 15.90381391 472
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

356. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-09 16:06:12 UTC
From: dickrb@lsid.hp.com
Message-ID: <CMEnED.G1M@hpcvsnz.cv.hp.com>
Source record: 28110
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

I will take one too.... Now you are down to 98 units left....

73 de w7wkr

357. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-09 21:35:04 UTC
From: rkarlqu@scd.hp.com
Message-ID: <2llfe8$e0p@hpscit.sc.hp.com>
Source record: 27961
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

Regarding my posting about Motorola GPS receiver boards:

It seems to have generated a lot of email.

Please get information directly from Motorola's Position
and Navigation Systems Business division if you
are interested. Call (708)-480-8000 and then follow the
directions about calling (800)-4-ONCORE. No, I don't
know what they cost in unit quantities. No, I haven't
hooked one up to my ham station. No, I am not interested
in coordinating a group purchase. I'm just giving you a
pointer to further information. Thank you.

Rick Karlquist N6RK
(I work for HP, not Motorola!)
rkarlqu@scd.hp.com

358. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-09 21:51:50 UTC
From: rtaylor@ux1.cso.uiuc.edu
Message-ID: <2llgdm$ma4@vixen.cso.uiuc.edu>
Source record: 27962
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

rkarlqu@scd.hp.com (Richard Karlquist) writes:

>The Motorola GPS receiver is less than $150 in 100's. It has six
>channels and just about all the features you would ever want.

So where do you get one in the "ones". Eagle's is $498 and
has 5 channels as I remember. Just what do you get with more
than 5 channels?

359. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-09 22:47:45 UTC
From: theeric@netcom.com
Message-ID: <theeric-090394144628@198.211.33.53>
Source record: 27963
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

> > The question is: who's going to be buying in 100's?
> I'm in (provided we find the 100 or better).

Heck I may take 2 of them.

Eric Hegstrom KA7CTO theeric@netcom.com

360. where do i qsl rs-12/13 robot??help

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 01:48:32 UTC
From: ab4vj@rock.concert.net
Message-ID: <2llu9g$qet@inxs.concert.net>
Source record: 27964
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

Help.... I worked the rs-12/13 cw robot and recvd my serial # Now where do I send the qsl card?? Thanks de ab4vj ..:wq

361. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 03:30:32 UTC
From: nick@vlsi.polymtl.ca
Message-ID: <1994Mar10.033032.19820@vlsi.polymtl.ca>
Source record: 27965
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

I'm in for one too. That 97...

Nick


```
**************************************************************************
* Nick Ciarallo *
* SR Telecom Inc. telephone: 514-335-2429 ex: 438 *
* Microwave Group facsimile: 514-334-7783 *
* 8150 Trans Canada Hwy internet : nick@vlsi.polymtl.ca *
* St. Laurent, Quebec hamradio : ve2hot@ve2fkb.pq.can.na *
* Canada H4S-1M5 *
**************************************************************************
* Accept no substitutes, *REAL* ham radio lives on 220 MHz! *
**************************************************************************
```

362. Re: Frustration over sat tracking prgs...

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 13:42:37 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CMGBF2.7w6@bbc.co.uk>
Source record: 27966

Sherman W. Spahr (spahr@csn.org) wrote:
: John Kondis (jkondis@orion.oac.uci.edu) wrote:

: : Is anyone else having any of the following problems?

: : I have tried to use several satellite tracking programs for the PC, but
: : have found no success... With the STS programs, I get an error message
: : something like this:

: : Error in line No line number in STSPLUS module at XXXX:XXXX <some funky
: : address>
: : Also, TrakSat will not run on my machine due to memory shortage, though I
: : have technically enough RAM to run it (according to docs)...

: : Then I went to QuickSat, for bare bones operation. Seems fine until it
: : tells you that March 8 1994 is a Thursday... Doesn't exactly make you
: : want to go and spend hours testing it's predictions, does it???

: : Has anyone had similar problems? Or do any of you PC wizards have any
: : suggestions? Are there any 'reliable' progs out there that are easy to
: : please???

: : Thanks in advance for any replies...
: : ...John
: : jkondis@orion.oac.uci.edu

: I have been running InstantTrack by Franklin Antonio (dist. by AMSAT)
: for several years. Have run IT on an XT, 386 and 486 (all had VGA).
: There have been two patches to the program to fix minor problems but
: other than that I have never had any trouble with the program.

: Works great and easy to use!!!

: ==
: Sherman Spahr ! spahr@adcom.com
: Systems Coordinator, ! wb0pcm@amsat.org
: Adams County Communications Center Inc. !
: (303) 289-2235 FAX (303) 287-2942 ! P.O. Box 1661
: SysOp, The Communications Center BBS ! Wheat Ridge, CO
: (303) 278-4075 8N1 ~38400 ! 80034-1661
: ==

I use satra for windows. I don't know if you can use windows, but this
prog is easy to use and weather sat crossings seem to happen at the time the
prog says.

regards John B
john.boyer@rd.eng.bbc.co.uk

363. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 14:16:38 UTC
From: tvaughan@nyx.cs.du.edu
Message-ID: <1994Mar10.141638.22592@mnemosyne.cs.du.edu>
Source record: 27967
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew,rec.radio.amateur.equipment

gscott@netcom.com (Gavin Scott) writes:

>Jesse L Wei (jlw3@cec3.wustl.edu) wrote:
>: Richard Karlquist (rkarlqu@scd.hp.com) wrote:
>: : The Motorola GPS receiver is less than $150 in 100's. It has six
>: : channels and just about all the features you would ever want.

>: The question is: who's going to be buying in 100's?

>I'll take one. Now you only have 99 more to get rid of!

>Gavin
>--
>Gavin Scott - Quest Software Inc - gavin@quests.com -or- gscott@netcom.com

Make that 98 more to get rid of.

Tom

364. STS-59 Element Set (94097.749)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 14:45:36 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94097.749@alsys.com>
Source record: 27968
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 00059U 94097.74947238 .00221188 00000-0 11303-3 0 70
2 00059 57.0053 276.3038 0009259 269.9963 90.0094 16.19806752 56

Satellite: STS-59
Catalog number: 00059
Epoch time: 94097.74947238 = (07 APR 94 17:59:14.41 UTC)
Element set: 007
Inclination: 57.0053 deg
RA of node: 276.3038 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-007
Arg of perigee: 269.9963 deg Launch: 07 APR 94 12:07 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris KK6YB Internet: elements-request@alsys.com
San Diego, CA, USA Phone: +1 619-457-2700
```

365. Re: Frustration over sat tracking prgs...

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 17:20:45 UTC
From: ian@isis.demon.co.uk
Message-ID: <763320045snz@isis.demon.co.uk>
Source record: 27969

In article <jkondis.763231047@orion.oac.uci.edu>
jkondis@orion.oac.uci.edu "John Kondis" writes:

>
>Is anyone else having any of the following problems?
>
>I have tried to use several satellite tracking programs for the PC, but
>have found no success... With the STS programs, I get an error message
>something like this:
>
>Error in line No line number in STSPLUS module at XXXX:XXXX <some funky
> address>
>Also, TrakSat will not run on my machine due to memory shortage, though I
>have technically enough RAM to run it (according to docs)...
>
>Then I went to QuickSat, for bare bones operation. Seems fine until it
>tells you that March 8 1994 is a Thursday... Doesn't exactly make you
>want to go and spend hours testing it's predictions, does it???
>
>Has anyone had similar problems? Or do any of you PC wizards have any
>suggestions? Are there any 'reliable' progs out there that are easy to
>please???
>
>Thanks in advance for any replies...
>...John
>jkondis@orion.oac.uci.edu

I've used STSPLUS, TRAKSAT and PCTRACK without problems. All these programs have been developing very fast, so it's possible you've been unlucky. So far, I've yet to fault any of them. PCTRACK appears to run in very little memory, but the other two do need a fairly empty machine. None of them are very fond of TSRs, although I suspect that this more of a timing problem than a memory one.

Regards
Ian.
--

| Ian Smith | "The Moving Finger writes;
| ian@isis.demon.co.uk | and, having writ, Moves on."

366. Re: Frustration over sat tracking prgs...

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 18:47:08 UTC
From: johnsotc@sd2.af.mil
Message-ID: <1994Mar10.184708.3146@afit.af.mil>
Source record: 27970

In article <jkondis.763231047@orion.oac.uci.edu>, jkondis@orion.oac.uci.edu (John Kondis) writes:
|>
|> Has anyone had similar problems? Or do any of you PC wizards have any
|> suggestions? Are there any 'reliable' progs out there that are easy to
|> please???
|>
|> Thanks in advance for any replies...
|> ...John
|> jkondis@orion.oac.uci.edu
|>
|>
|>

Have you tried PC-Track 3.0 on SimTel or garbo?

oak.oakland.edu pub/msdos/satelites pctrk30a.zip pctrk30b.zip
garbo.uwasa.fi pc/ham pctk301a.zip pctk301b.zip

367. STS-62 Element Set (94068.595)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-10 19:00:37 UTC
From: elements-request@alsys.com
Message-ID: <STS-62.94068.595@alsys.com>
Source record: 27971
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-62
1 23025U 94015A 94068.59580888 +.00001051 52944-5 85114-5 0 136
2 23025 39.0153 215.8823 0005877 312.4483 47.5827 15.90459642 813

Satellite: STS-62
Catalog number: 23025
Epoch time: 94068.59580888 (09 MAR 94 14:17:57.89 UTC)
Element set: GSFC-013
Inclination: 39.0153 deg
RA of node: 215.8823 deg Space Shuttle Flight STS-62
Eccentricity: 0.0005877 Keplerian Elements
Arg of perigee: 312.4483 deg
Mean anomaly: 47.5827 deg
Mean motion: 15.90459642 rev/day Semi-major Axis: 6679.1279 Km
Decay rate: 0.11E-04 rev/day*2 Apogee Alt: 304.67 Km
Epoch rev: 81 Perigee Alt: 296.81 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris KK6YB Internet: elements-request@alsys.com
San Diego, CA, USA Phone: +1 619-457-2700
```

368. ORBS$070.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-11 14:08:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-070.m.1994@ampr.org>
Source record: 27972
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-070.M
Orbital Elements 070.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX March 11, 1994
BID: $ORBS-070.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94068.17748386
Element set: 262
Inclination: 98.6568 deg
RA of node: 144.9950 deg
Eccentricity: 0.0010522
Arg of perigee: 125.3851 deg
Mean anomaly: 234.8327 deg
Mean motion: 14.28009726 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 2342
Checksum: 309

Satellite: MIR
Catalog number: 16609
Epoch time: 94070.24194089
Element set: 170
Inclination: 51.6441 deg
RA of node: 317.2746 deg
Eccentricity: 0.0014925
Arg of perigee: 20.9171 deg
Mean anomaly: 339.2181 deg
Mean motion: 15.58120678 rev/day
Decay rate: 4.8719e-04 rev/day^2
Epoch rev: 46077
Checksum: 309

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94069.79166515
Element set: 456
Inclination: 28.4682 deg
RA of node: 147.9860 deg
Eccentricity: 0.0006415
Arg of perigee: 138.1868 deg
```

Mean anomaly: 221.9207 deg
Mean motion: 14.90518485 rev/day
Decay rate: 1.109e-05 rev/day^2
Epoch rev: 1469
Checksum: 321

Satellite: GRO
Catalog number: 21225
Epoch time: 94069.68912255
Element set: 72
Inclination: 28.4620 deg
RA of node: 195.6665 deg
Eccentricity: 0.0003925
Arg of perigee: 176.6497 deg
Mean anomaly: 183.4127 deg
Mean motion: 15.40327704 rev/day
Decay rate: 5.994e-05 rev/day^2
Epoch rev: 4173
Checksum: 315

Satellite: UARS
Catalog number: 21701
Epoch time: 94067.64252385
Element set: 485
Inclination: 56.9829 deg
RA of node: 201.9698 deg
Eccentricity: 0.0004222
Arg of perigee: 99.9238 deg
Mean anomaly: 260.2271 deg
Mean motion: 14.96479516 rev/day
Decay rate: 2.623e-05 rev/day^2
Epoch rev: 13588
Checksum: 331

/EX

369. * SpaceNews 14-Mar-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-03-11 16:52:54 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0314.1994@ampr.org>
Source record: 27973
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

```
SB NEWS @ AMSAT $SPC0314
* SpaceNews 14-Mar-94 *

BID: $SPC0314

=========
SpaceNews
=========

MONDAY MARCH 14, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* SPACE CALENDAR *
==================
March 1994
Mar ?? - TC-2C Launch
Mar ?? - Solidaridad II Ariane Launch
Mar 02 - GPS Launch
Mar 05 - 15th Anniversary, Voyager 1 Jupiter flyby
Mar 08 - Galileo, Ida Data Playback, Part 2 (for 3 months)
Mar 14 - Albert Einstein's 115th Birthday
Mar 25 - DSPSE (Clementine) Lunar Mapping Orbit Change
Mar 27 - 25th Anniversary, Mariner 7 Launch (Mars Flyby Mission)
Mar 29 - 20th Anniversary, Mariner 10, 1st Mercury Flyby
Mar 31 - Galaxy 1R Delta 2 Launch
Mar 31 - STS-59, Endeavour, SRL-1

[Info via NASA/JPL]

* OSCAR BANDPASS *
==================
SUNDAY 6:
145898.6 TI5RLI 2129Z AO-13
145889.6 VP2EEE 2119Z AO-13
145906.9 TI5RLI 2003Z AO-13

MONDAY 7:
145896 HL9KT 0541Z AO-13
145885.3 VP2EEE 2043Z AO-13

TUESDAY 8:
145874.0 W3QBK 2037Z *** cross SAT AO13/AO10
145889.0 VP2EEE 2024Z AO-13 QSL via KK3K
```

WEDNESDAY 9:
145900.3 TU2OJ 1837Z AO-13 laut
145889.8 YO3AC 1837Z Andy AO-13
145885.0 VP2EEE 1815Z AO-13
145909.0 8P6SM 1621Z AO-13

[Info via Sergio, IK5AAX]

* UoSAT-OSCAR-11 NEWS *
==========
The following is from the UoSAT-OSCAR-11 satellite control center and is currently being transmitted by the spacecraft on its VHF downlink:

Surrey Satellite Control Centre
University of Surrey
Guildford, Surrey GU2 5XH
England

February 8, 1994

Greetings to all UO-11 users around the world.

As followers of this mission know, during the past several months UO-11 has experienced some problems which have led to a disruption of regular services. Thanks to the efforts of G8NOB and a core of engineers at UoSAT, we can report that the spacecraft has been returned to a reasonable operating state.

We are now going to take this opportunity to make some adjustments to the UO-11 operating schedule. For the past several weeks the spacecraft has been exclusively transmitting binary WOD and telemetry data. This step has been taken to allow us to download the maximum amount of data as possible for diagnostic purposes. This will continue for the foreseeable future. However, we understand that many of the UO-11 tracking stations around the world are only equipped for ASCII data format, therefore we are proposing to set aside two days a week, Wednesday and Saturday, where the primary data format will be ASCII. The spacecraft will transmit ASCII WOD, telemetry and bulletin material during this period in addition to short durations of binary telemetry. In addition, ASCII bulletin material will be included in the daily transmission cycle so that bulletin material may be available daily.

As of 09-Feb-94, the 2.4 GHz beacon aboard UO-11 has been activated. This beacon will be left on whole orbit as long as the power budget permits. We would be interested in reception reports and observations of the 'S' band transmissions from UO-11.

More activities are planned, memory space aboard the spacecraft limits us from going into more detail in this bulletin. Watch this space for more details. We are interested in your comments, please let us hear from you at the address above.

73, G0SYX for UoSAT

* FO-20 SCHEDULE *
==========
The FO-20 command station announced that FO-20 will be placed in Mode JA (Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through 26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:
09-Mar-94 07:05 -to- 16-Mar-94 07:30 UTC
23-Mar-94 07:52 -to- 30-Mar-94 08:15 UTC

Digital mode: Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* AWARD NOMINATIONS SOUGHT *
==========
The Westlink Report ham radio newsletter indicates that the nominating period for its annual Young Ham of the Year Award closes on Saturday April 30th.

The Westlink Report Young Ham of the Year award was conceived back in 1986 to honor the younger members of the Amateur Radio Community.

This is not a prize drawing or lottery! There is no filing fee or any other charge to submit a nomination. However, the sponsors of this young peoples award have set very strict criteria for who may even be nominated. A nominee must be age 18 or younger, must hold a valid United States Amateur Radio license issued by the FCC and he/she must have, in the eyes of the judges, made a significant contribution to the nation, to his/her community, to the Amateur Service (or any combination there-of) through the use of Amateur Radio. All nominating packages must include detailed information on and proof of any claim made for the person being proposed to receive the award.

By way of example (and exaggeration) -- nominating a 5 year old Extra Class ham whose only achievement has been attaining his/her Extra class license by age 5 would only prove that wrote memorization is possible in a young child and nothing more. Such a nomination would be rejected by the judges. Let that same 5 year old Extra run an Emergency Net for 72 hours following a 7.7 earthquake and you have a situation where the judges would give careful consideration.

With corporate underwriting from Yaesu USA Corporation, the 1994 winner will receive a trip to the Sea Pac convention in Seaside Oregon (June 4-5), a piece of ham radio equipment and a special plaque denoting his or her accomplishments to the Amateur Radio service.

All nominations must be submitted on an official application available for a Self Addressed Stamped Envelope to the Westlink Report Young Ham of the Year, 28197 Robin Avenue Saugus California 91350. (Application requests not accompanied by an SASE will be discarded.)

The name and call sign of the individual selected as the 1994 Westlink Report Young Ham of the Year for 1994 will be announced in early May.

For further information please contact Burt Hicks WB6MQV at (805) 251-5558 or Bill Pasternak WA6ITF at (805) 296-7180

[Info via Bill Pasternak, WA6ITF]

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

370. Wanted: Satellite antennas and/or recommendations

Newsgroup: rec.radio.amateur.space
Date: 1994-03-11 21:40:45 UTC
From: debaker@bnr.ca
Message-ID: <2lqogt$46o@crchh7b0.bnr.ca>
Source record: 27974

Greetings fellow satellite enthusiasts,

I am in the process of setting up a satellite system, and I am looking for antennas and accessories, or recommendations for antennas and accessories you like/don't like.

Also, if you know of any good references for building antennas, power dividers, measuring feedlines, building switching pre-amps, home brewed az-el rotators, or any of those other satellite related things, I would like to hear from you.

I am specifically interested in satellite antennas & accessories for 2m, 70cm, 24cm, and 13cm.

Thanks!


```
_____________________________________________________________________
| David E. Baker | Internet: debaker@bnr.ca (Richardson, TX, USA) |
| IP: 47.122.65.7 | UnixID: crchh7b0 | Bell-Northern Research, Inc. |
| Callsign: AB5PI | Packet: AB5PI@N5AUX.#DFW.TX.USA.NA | Smile! ;-) |
| My opinions do not necessarily reflect the opinions of my employer |
|---------------------------------------------------------------------|
```

371. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-03-12 00:58:41 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.763433921@afit.af.mil>
Source record: 27975
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 62
1 23025U 94015A 94069.91666667 .00001260 52955-5 91576-5 0 170
2 23025 39.0142 207.1724 0005680 323.6151 50.6703 15.90477421 1019
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

372. ARLS012 Astronaut to Russia

Newsgroup: rec.radio.amateur.space
Date: 1994-03-12 12:32:46 UTC
From: w1aw-list-approval@world.std.com
Message-ID: <$arls012.1994@ampr.org>
Source record: 27976
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SPACE @ ARL $ARLS012
ARLS012 Astronaut to Russia

ZCZC AS56
QST de W1AW
Space Bulletin 012 ARLS012
From ARRL Headquarters
Newington, CT March 8, 1994
To all radio amateurs

SB SPACE ARL ARLS012
ARLS012 Astronaut to Russia

Astronaut to Russia

Astronaut Ken Cameron, KB5AWP, has been named Director of Operations-Russia and manager of NASA operational activities at Star City and at the Russian control center at Kaliningrad.

He will work with Russian Space Agency engineers and flight controllers on the US-Russia cooperative space program, including supervising NASA astronaut training at Star City and developing plans and procedures to support joint space shuttle-Russian Mir space station flights and space station development.

He is expected to command one of the early shuttle docking missions with Mir.

Cameron, 44, has flown on two SAREX shuttle flights, STS-37 in 1991 and STS-56 in 1993. Both these shuttles were ''all-ham flights.''
NNNN
/EX

373. STS-62 Orbital State Vectors Rev #127

Newsgroup: rec.radio.amateur.space
Date: 1994-03-12 14:04:06 UTC
From: astroman@netcom.com
Message-ID: <astromanCMK1qu.Ht4@netcom.com>
Source record: 27977
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-62
Catalog Number: 23025 94015A
Epoch Date/Time: 94071.54378717593
03/12/1994 13:03:03.212 UTC
EFG E: -21601188.28 ft
F: 427444.25 ft
G: -3594534.34 ft
Edot: -2917.9332 ft/s
Fdot: -18346.5230 ft/s
Gdot: 15427.2324 ft/s
ndot/2 (drag): 0.00001260000 rev/day^2
nddt/6: 5.29550E-06 rev/day^3
Bstar: 9.15760E-07 1/Earth Radii
Elset #: 18
Rev @ Epoch: 127.95819434002

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

374. Re: Frustration over sat tracking prgs...

Newsgroup: rec.radio.amateur.space
Date: 1994-03-12 16:47:05 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <CMK9AH.9Cz@freenet.carleton.ca>
Source record: 27978

>: jkondis@orion.oac.uci.edu
>
>I have been running InstantTrack by Franklin Antonio (dist. by AMSAT)
>for several years. Have run IT on an XT, 386 and 486 (all had VGA).
>There have been two patches to the program to fix minor problems but
>other than that I have never had any trouble with the program.
>
>Works great and easy to use!!!
>
> (303) 289-2235 FAX (303) 287-2942 ! P.O. Box 1661
> SysOp, The Communications Center BBS ! Wheat Ridge, CO
> (303) 278-4075 8N1 ~38400 ! 80034-1661

That sounds good ;please advise on how and where to get it.Source code
would be ideal,but anything that runs on PC would be fine.
Thanks for your trouble in advance.
Herb.

375. new stsplus??

Newsgroup: rec.radio.amateur.space
Date: 1994-03-13 00:22:28 UTC
From: brunelli_pc@delphi.com
Message-ID: <BE7sY6c.brunelli_pc@delphi.com>
Source record: 27979

I have heard a few rumors about SOP94???, and that it tracks
multiple sats. Any info on validity, ftp availability,
or otherwise would be grealyly appreciated

thanks

pete brunelli
n1qdq

376. Re: new stsplus??

Newsgroup: rec.radio.amateur.space
Date: 1994-03-13 09:36:41 UTC
From: ian@isis.demon.co.uk
Message-ID: <763551401snz@isis.demon.co.uk>
Source record: 27980

In article <BE7sY6c.brunelli_pc@delphi.com> brunelli_pc@delphi.com writes:

>I have heard a few rumors about SOP94???, and that it tracks
>multiple sats. Any info on validity, ftp availability,
>or otherwise would be grealyly appreciated
>
>thanks
>
>pete brunelli
>n1qdq
>

I thought that STSPLUS had tracked multiple sats since version 9333.
Having said that, there appears to be several new versions per year,
so a 94?? has probable appeared. For some reason, STSPLUS has always
been hard to get via FTP. The BBS is the best place and CIS appears
to be kept up to date. FWIW the latest I've seen is 9353.

Regards
Ian.
--

| Ian Smith | "The Moving Finger writes;
| ian@isis.demon.co.uk | and, having writ, Moves on."

377. ARLK010 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-03-13 15:56:04 UTC
From: w1aw-list-approval@world.std.com
Message-ID: <$arlk010.1994@ampr.org>
Source record: 27981
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK010
ARLK010 Keplerian data

ZCZC SK77
QST de W1AW
Keplerian Bulletin 10 ARLK010
From ARRL Headquarters
Newington, CT March 12, 1994
To all radio amateurs

SB KEP ARL ARLK010
ARLK010 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94069.18379542 -.00000210 10000-3 0 2684
2 14129 27.1934 337.9178 6022504 160.8947 238.2860 2.05878778 52779
RS-10/11
1 18129U 87054 A 94067.01740430 0.00000036 22615-4 0 8807
2 18129 82.9209 43.6165 0010632 312.3195 47.7057 13.72332558336038
UO-11
1 14781U 84021 B 94067.56924816 0.00000314 61190-4 0 6729
2 14781 97.7916 86.9836 0010793 229.7625 130.2638 14.69163339535534
RS-12/13
1 21089U 91007 A 94067.45619162 0.00000044 30495-4 0 6705
2 21089 82.9185 86.1590 0030648 31.0404 329.2549 13.74036632154815
AO-13
1 19216U 88051 B 94069.54851579 -.00000456 10000-4 0 8925
2 19216 57.8718 263.9681 7210511 336.6114 2.6497 2.09726483 12443
UO-14
1 20437U 90005 B 94067.73687474 0.00000061 40486-4 0 9725
2 20437 98.5922 153.8649 0011592 122.8019 237.4277 14.29828748215238
AO-16
1 20439U 90005 D 94067.72631072 0.00000054 37964-4 0 7726
2 20439 98.6003 154.9835 0011895 123.8347 236.3959 14.29883809215246
DO-17
1 20440U 90005 E 94067.27061045 0.00000070 44036-4 0 7710
2 20440 98.6012 154.8241 0012085 124.8077 235.4243 14.30022491215195
```

```
WO-18
1 20441U 90005 F 94067.73395059 0.00000053 37414-4 0 7732
2 20441 98.6000 155.2882 0012520 123.5482 236.6892 14.29998053215264
LO-19
1 20442U 90005 G 94069.25806460 0.00000090 42470-4 0 7497
2 20442 98.6006 157.0275 0013027 119.1463 241.1023 14.30092955215490
FO-20
1 20480U 90013 C 94067.40210310 -.00000055 -49320-4 0 6679
2 20480 99.0229 238.3245 0540340 207.7414 149.3880 12.83223761191206
AO-21
1 21087U 91006 A 94069.83595116 0.00000094 82657-4 0 4438
2 21087 82.9370 215.4726 0036191 0.5572 359.5617 13.74535665156075
UO-22
1 21575U 91050 B 94067.16659976 0.00000088 44344-4 0 4735
2 21575 98.4399 143.6682 0006939 228.7234 131.3361 14.36896892138577
KO-23
1 22077U 92052 B 94067.55219489 -.00000037 10000-3 0 3689
2 22077 66.0788 130.6842 0011228 312.6441 47.3631 12.86285294 73847
KO-25
1 22830U 93061H 94067.68367155 0.00000069 45175-4 0 2725
2 22830 98.5652 142.8126 0012170 107.8757 252.3739 14.28038885 23353
IO-26
1 22826U 93061 D 94068.07086926 0.00000012 22619-4 0 2690
2 22826 98.6625 144.8782 0009958 137.9486 222.2467 14.27713554 23404
AO-27
1 22825U 93061 C 94067.73218374 -.00000005 15777-4 0 2695
2 22825 98.6625 144.5201 0009388 138.6898 221.4999 14.27610714 23357
PoSat
1 22829U 93061 G 94068.17748386 0.00000070 46048-4 0 2628
2 22829 98.6568 144.9950 0010522 125.3851 234.8327 14.28009726 23423
STS-59
1 99959U 94097.74947238 0.00221188 11303-3 0 76
2 99959 57.0053 276.3038 0009259 269.9963 90.0094 16.19806752 53
STS-62
1 23025U 94015 A 94069.91666667 0.00001260 52955-5 91576-5 0 170
2 23025 39.0142 207.1724 0005680 323.6151 50.6703 15.90477421 1019
Mir
1 16609U 86017 A 94070.24194089 0.00048719 63440-3 0 1700
2 16609 51.6441 317.2746 0014925 20.9171 339.2181 15.58120678460770

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
March 15, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

378. ANS-071 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-03-13 17:17:34 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-071.01.1994@ampr.org>
Source record: 27982
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-071.01
W3IWI EXPLAINS SAT PROPAGATION

HR AMSAT NEWS SERVICE BULLETIN 071.01 FROM AMSAT HQ
SILVER SPRING, MD MARCH 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-071.01

W3IWI Explains A Propagation Phenomenon Observed By IT9XXS

Giovanni Mazzola (IT9XXS) posed a question about a propagation phenomenon he has been noticing on KO-23, KO-25, UO-22 and other digital satellites. He reported that he has regularly observed that at the end of the pass, when the satellite is between 0 and -2 degrees elevation, the signal exhibits three strong peaks. During the pass it may be S4 but when the three peaks in signal strength occur, they are over S9. After that he loses the signal altogether. He notes that he has a good horizon, looking out to the sea to the north.

Ton Clark (W3IWI) offers the following explanation: What IT9XXS is observing is classic and very predictable. It is the result of two physical effects: atmospheric refraction and "Lloyd's Mirror" reflections.

The earth's atmosphere bends the signals so that your "radio" horizon is below the physical horizon. The refractive index of the air is about 300 parts per million different from unity depending on the temperature and water vapor content of the air. This is precisely the reason that most line-of-sight computations of terrestrial paths increase the effective radius of the earth by about 1.33. Under some tropospheric conditions like when the temperature increases with height and/or when anomalous water vapor content is present, ducting can occur and VHF/UHF paths may extend to thousands of kilometers. This is especially true of over-water paths like the frequent duct that occurs between southern California and Hawaii or between Italy and Spain. Since the path in question is over water, this is probably the reason signals are received from the satellite when it is below the apparent horizon.

The second effect that is occurring is a reflection of the signals from the water, so the antenna is receiving two different signals. In optics this is often called the "Lloyd's mirror" effect. When the signal is reflected, its phase is changed by 180 degrees, so the direct and reflected signals arrive at the antenna out of phase and cancel at the horizon. At other elevations, the two signals traverse different paths so the phase difference of the direct and reflected signals varies, and the signals may either add constructively (increasing the signal

strength) or destructively (causing a null). If the angles at which maxima and minima signal were known, it would be possible to compute the height of receiving antenna above the level of the sea (reflector).

This reflection effect was first seen in about 1947 when some Australians observed the radio "star" Cygnus-A from an antenna atop a sea cliff. The fact that they observed deep nulls allowed them to demonstrate that Cygnus-A was a compact object, smaller than a few arc-minutes in diameter and not a large-scale feature of the previously discovered radiation from our Milky Way galaxy. This work was done at VHF frequencies not far from our 2M amateur band.

[The AMSAT News Service (ANS) would like to thank Tom Clark (W3IWI) for this explanation and IT9XXS for posing the question.]

/EX
SB SAT @ AMSAT $ANS-071.02
STS-59 SAREX INFO

HR AMSAT NEWS SERVICE BULLETIN 071.02 FROM AMSAT HQ
SILVER SPRING, MD MARCH 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-071.02

N5QWL Provides A "Fact" Sheet For The Upcoming STS-59 SAREX Mission

Shuttle Amateur Radio Experiment (SAREX) Fact Sheet

STS-59 Space Shuttle Endeavour

When: Planned Launch April 7, 1994 at 12:07 UTC for 9 days of 2M operations.

Where: Earth Orbit. Altitude 220 kilometers, with radio coverage of latitudes from 70 degrees North to 70 degrees South. We are in one of the lowest altitude orbits ever flown by the shuttle, so pass times will be shorter than usual.

Operators: Dr. Jay Apt (N5QWL) and Dr. Linda Godwin N5RAX. N5QWL is the commander of the Blue Shift aboard Endeavour and will operate the shuttle systems during the "night" shift, while N5RAX is the Payload Commander, responsible for overall operation of three large radars in the shuttle's cargo bay during the "day" shift.

Modes: FM Voice
VOICE CALL SIGNS: N5QWL and N5RAX
Packet (Beacons giving daily mission activities daily if we get a chance, and robot QSOs -- successful connects will be issued a contact number by the robot) PACKET CALL SIGN: W5RRR-1

Frequencies: We will operate split.
PLEASE DO NOT TRANSMIT ON THE DOWNLINK FREQUENCY!

VOICE: Downlink (shuttle transmits) on 145.55 MHz
Uplink (ground transmits) on 144.91, 144.93, 144.95,
144.97, and 144.99 (except over Europe) - we'll listen
on those 5 frequencies to spread out the pileup a bit.
Uplink for Europe only: 144.80, 144.75, 144.70

Successful QSOs on voice will be facilitated by using
standard international phonetics for your call sign.
We will not answer any stations using non-standard
phonetics. Use your entire call sign -- we log with an
audio tape recorder. Do not use our call sign --
passes are very short, and we want to work as many
folks as possible.

PACKET: Downlink (shuttle transmits) on 145.55
Uplink (ground transmits) on 144.49 (worldwide)

If you can, decrease your radio's deviation to 3 KHz (most are
initially set at 5 KHz) and compensate for the Doppler shift. If
you cannot, wait until a minute or 90 seconds after we come over
your horizon to transmit -- that will put you within our IF. If a
station transmits without following these suggestions, we just hear
what sounds like a noisy carrier. The above applies to both voice
and packet.

QSL via: ARRL, ATTN: STS-59 QSLs, 225 Main Street, Newington, CT 06111,
USA. Include a self-addressed stamped envelope (SASE). Non-US
stations include a self addressed envelope with $0.50 of US
postage affixed or appropriate IRCs. Include the Callsign worked,
Date, UTC, Mode, and Frequency. For packet contacts, include the
QSO number issued by the robot. SWL QSL's: Include the Callsign
heard, Date, UTC, Mode, and Frequency.

Information during the mission: AMSAT bulletins, Compuserve, Genie,
Prodigy, local packet bulletin boards,
ARRL bulletins, and HF voice from NASA
Johnson Space Center ARC, Houston, Texas,
W5RRR, or NASA Goddard Spaceflight Center
ARC, Greenbelt, Maryland, WA3NAN,
frequencies listed below.

W5RRR may be found on or near: 7.215, 14.280, 21.360, and 28.400 MHz.

WA3NAN retransmits NASA Select Audio and SAREX bulletins simultaneously on
or near 3.860, 7.185, 14.295, 21.395, and 28.650 MHz.

The NASA Info BBS at Johnson Space Center, Houston, will also carry
Keplerian elements and SAREX bulletins. (713) 483-2500, 1200 baud,
8-N-1. At the "ENTER NUMBER:" prompt, type 62511 <return> and log onto the
BBS. The Keps and bulletins will be in the welcome message. Disconnect
rapidly to facilitate access by others.

Operations Notes: If you have a packet QSO number issued to you by the
robot, don't try to get another one! Our on-board

program drops the duplicates anyhow, and all you
are doing is making it harder for the other folks. We'll
issue you a QSL card if you appear in the "heard" list on
the TNC and we have issued you a QSO number...that's a
2-way contact, AND REMEMBER, THIS IS ONLY A HOBBY!

N5QWL will be asleep over most USA passes, and N5RAX will be busy with
assigned duties for most daylit US passes, so try us on packet over the
USA if the sun is up. Remember, our packet call sign is W5RRR-1. We'll
try to work voice (1) when we are not otherwise engaged, and (2) at night
or when the ground is cloudy (we are generally busy taking pictures of the
Earth during clear daylight passes).

If I can get to it, I'll activate the SAREX about 3 hours into the mission;
deactivation will occur at about 8 days, 17 hours after launch (unless we
get a one-day science mission extension, then it will be deactivated at
about 9 days, 17 hours after launch).

Prelaunch Keplerian Elements, courtesy of Gil Carman (WA5NOM) of the JSC
ARC):

STS-59
1 00059U 94097.74947238 .00221188 00000-0 11303-3 0 70
2 00059 57.0053 276.3038 0009259 269.9963 90.0094 16.19806752 56

Satellite: STS-59
Catalog number: 00059
Epoch time: 94097.74947238 = (07-APR-94 17:59:14.41 UTC)
Element set: 007
Inclination: 57.0053 deg
RA of node: 276.3038 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-007
Arg of perigee: 269.9963 deg Launch: 07-APR-94 12:07 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5
Checksum: 327

[The AMSAT News Service (ANS) would like to thank N5QWL for in this
bulletin item.]

/EX
SB SAT @ AMSAT $ANS-071.03
AO-13 OPERATIONS NET SCHEDS

HR AMSAT NEWS SERVICE BULLETIN 071.03 FROM AMSAT HQ
SILVER SPRING, MD MARCH 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-071.03

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

19-Mar-94 1730 B 073 W5IU WA5ZIB
26-Mar-94 2130 B 084 WA5ZIB W5IU

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

AO-13 ZRO Tests For March 1994

The following schedule of Mode "B" tests were chosen for convenient operating times and favorable squint angles. The tests can be heard on 145.840 MHz. Andy McAlister (WA5ZIB) will conduct all the tests. Mode "JL" tests will no longer occur due to the failure of AO-13's 70CM trans-mitter.

Day Date (UTC) Time Areas covered

Saturday Mar. 19, 1994 1930 UTC NA, SA, Europe, Africa
Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC". Any changes will be announced as soon as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy MacAllister (WA5ZIB), AMSAT V.P. User Operations, 14714 Knights Way Drive, Houston, TX 77083-5640. A report will be returned verifying the level of accurate reception. An S.A.S.E. is appreciated but not required.

/EX
SB SAT @ AMSAT $ANS-071.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 071.04 FROM AMSAT HQ
SILVER SPRING, MD MARCH 12, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-071.04

Weekly OSCAR Status Reports: 12-MAR-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jan 31-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 145 |<- S transponder; B trsp. is OFF

Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:

23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC

DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

RS-10: Still operating normally for ZS6AOP. The usual regular stations are often found working thru the satellite as well as the "odd" new comer. Reports of copying the beacon while well below the horizon, over the South Pole on south-to-north passes with good signal strengths have been coming in. Hopefully, with more stations becoming active there will be some real long distance sub-horizon contacts soon. [ZS6AOP]

RS-12: RS-12 is currently operating in Mode K. The uplink passband is 21.210 - 21.250 MHz with downlink on 29.410 - 29.450 MHz. The transponder is non-inverting USB or CW, i.e., if you are on 21.225, then listen on 29.425 +/- the doppler shift, adjust your transmit frequency as you work the satellite to keep the downlink frequency constant. The beacon frequencies are 29.408 MHz or 29.454 MHz. The Robot operates on 29.454 MHz. The uplink frequency for the the Robot is 21.129 MHz. When the Robot is not operating, this freq-uency pair can also be used for general QSOs.
[KB8FGC @ KC8TW.#swoh.usa.na]

AO-21: This OSCAR sends down beautiful signals, 59+ signals about 90% of the time. Along with DOVE, ZS6AOP can recommend AO-21 to anyone who wants to start capturing and examing telemetry using basic equipment. [ZS6AOP]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

IO-26: Operating normally. [WH6I]

KO-23: Operating normally. [WH6I]

KO-25: Operating normally. KO-25 has a number of new earth images this past week. So far WH6I notes that he has not seen any pictures that were particularly interesting to him. [WH6I]

AO-27: There is no particular schedule transponder schedule per se, and the way it works is that amateur radio section of the satellite has only solar cell illumination to power it so as to not strain the drain of on board battery power on the commercial side. Therefore, if your

using ITRACK OR QUICKTRACK watch the sun terminator (sun darkness line) when it crosses into the light, the Analog repeater turns on but not until it is in sunlight. N4OUL's own experience is that he has worked it with a hand held ICOM-2AT on low power 2.5 W into 4 el 2M antenna and was full quieting stateside. Also VE3BDR worked it with a portable low power with a mag mount. Uplink on 2M is FM at 145.850 MHz and downlink on FM at 436.800 MHz. [N4OUL]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

379. Tokyo HiPower HL-90U Amp

Newsgroup: rec.radio.amateur.space
Date: 1994-03-13 20:54:19 UTC
From: ggs@lanl.gov
Message-ID: <2lvrga$jpo@newshost.lanl.gov>
Source record: 27983
Cross-posted to: rec.radio.swap,rec.radio.amateur.space,rec.radio.amateur.misc,rec.radio.amateur.equipment

Recently I have aquired a THP HL-90U amplifier with it I got
a schematic drawing only no other docs. I would love to aquire
both the owners manual and service manual. Actually I would be
happy with anything. The usual offer to compense for copying
mailing etc applies.

380. STS-62 Orbital State Vectors Rev #148 (pre-OMS3)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-14 04:33:29 UTC
From: astroman@netcom.com
Message-ID: <astromanCMn0nt.1pD@netcom.com>
Source record: 27984
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

(Note: OMS-3 Burn Scheduled for MET 9/16:45 or 0038 CST (3/14/94))

Vector format = 117
Satellite Name: STS-62
Catalog Number: 23025 94015A
Epoch Date/Time: 94072.83620737269
03/13/1994 20:04:08.317 UTC
EFG E: -148638.31 ft
F: -21512812.23 ft
G: -4199104.29 ft
Edot: 18511.3019 ft/s
Fdot: 2832.2320 ft/s
Gdot: -15206.2017 ft/s
ndot/2 (drag): 0.00001260000 rev/day^2
nddt/6: 5.29550E-06 rev/day^3
Bstar: 9.15760E-06 1/Earth Radii
Elset #: 21
Rev @ Epoch: 148.54909713854

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM

381. Re: new stsplus??

Newsgroup: rec.radio.amateur.space
Date: 1994-03-14 10:14:45 UTC
From: Timothy.Satterfield@launchpad.unc.edu
Message-ID: <2m1del$8v1@samba.oit.unc.edu>
Source record: 27985

In article <763551401snz@isis.demon.co.uk>,
Ian Smith <ian@isis.demon.co.uk> wrote:
>In article <BE7sY6c.brunelli_pc@delphi.com> brunelli_pc@delphi.com writes:
>
>>I have heard a few rumors about SOP94???, and that it tracks
>>multiple sats. Any info on validity, ftp availability,
>>or otherwise would be grealyly appreciated

Pete, the main thing you need to know about the program is that it
works best with a math co-processor and/or a fast cpu, 20 MHz or
higher. It is an excellent, well written program for tracking satellites.

>>thanks
>>
>>pete brunelli
>>n1qdq
>>
>

>I thought that STSPLUS had tracked multiple sats since version 9333.
>Having said that, there appears to be several new versions per year,
>so a 94?? has probable appeared. For some reason, STSPLUS has always
>been hard to get via FTP. The BBS is the best place and CIS appears
>to be kept up to date. FWIW the latest I've seen is 9353.
>
>Regards
>Ian.

I recently saw version 9405 on a local Fidonet bbs where I hang out.
The archive date is 280194. The author of STSPLUS dates his releases
by the year (94) and the week (05) of release.

I will check to see if it is on any ftp sites.

--
timothy.satterfield@bbs.oit.unc.edu KD4MYN KD4MYN@KB4WGA.#NC.USA.NA
timothy.satterfield@psybbs.durham.nc.us 1:3641/1.740
tsatterf@nyx10.cs.du.edu A part of the solution, not the problem.
Near the Durham County Hospital in beautiful, downtown Braggtown, NC.
--

\ The above does not represent OIT, UNC-CH, laUNChpad, or its other users. /
----

382. Portable AO-13 operation

Newsgroup: rec.radio.amateur.space
Date: 1994-03-14 18:26:44 UTC
From: zlau@arrl.org
Message-ID: <1994Mar14.182644.8734@arrl.org>
Source record: 27986

Looks like Mode S is the way to go for most
portable station that can work well through
AO-13. Maybe that is why they have Mode B
receiving contests--takes a lot more work to
hear the transponder noise floor....

As I thought, as confirmed by G3RUH in a
recent published letter, the beacon uses
all the transponder power, thus you
want to be *weaker* than the beacon.
During a busy pass, I guess this means you
want your signal to be at least 6 dB
weaker, to accomodate at least 4 users.

My 2 foot dish for for 2.4 GHz receive
is probably too big, I'll be trying a
small helix with a 0.4 dB system NF converter
when (if?) the weather gets nice outside.

Wonder if anyone has gotten the HP PHEMT
to work well on this band? The data sheet
says a device NF of 0.13, but given the
error inherant in such a measurement, it
might be no better than other PHEMTs. I'll
be bringing something to the West Coast
VHF conference for comparison.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

383. Re: new stsplus??

Newsgroup: rec.radio.amateur.space
Date: 1994-03-14 21:10:18 UTC
From: dsharp@netcom.com
Message-ID: <dsharpCMoAt6.6vr@netcom.com>
Source record: 27987

brunelli_pc@delphi.com wrote:
> I have heard a few rumors about SOP94???, and that it tracks
> multiple sats. Any info on validity, ftp availability,
> or otherwise would be grealyly appreciated

I found SOP9405 at grivel.une.edu.au in directory
/pub/ham-radio/funet/ham/satellite/tracking.

73, Dave

--
Dave Sharp - NU8H Dayton, Ohio dsharp@netcom.com

Made from only the freshest electrons and 100% pure ASCII to
insure that you have the best possible newsreading experience.

384. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-03-15 00:44:30 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.763692270@afit.af.mil>
Source record: 27988

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 62
1 23025U 94015A 94073.32846065 .00069430 75427-5 98989-4 0 257
2 23025 39.0144 184.6491 0007547 262.5411 240.1813 16.04851851 1551
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

385. STS-62 Orbital State Vector Rev #163 (Post OMS-4)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-15 01:05:04 UTC
From: astroman@netcom.com
Message-ID: <astromanCMoLoI.6yH@netcom.com>
Source record: 27989
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 7
Satellite Name: STS-62
Catalog Number: 23025 94015A
Epoch Date/Time: 94073.79437932870
03/14/1994 19:03:54.374 UTC
ECI X: -5076.328225 km
Y: 3270.819647 km
Z: -2756.382000 km
Xdot: -4.994451884 km/s
Ydot: -4.657109101 km/s
Zdot: 3.667411000 km/s
ndot/2 (drag): 0.00069430000 rev/day^2
nddt/6: 7.54270E-06 rev/day^3
Bstar: 9.89890E-05 1/Earth Radii
Elset #: 23
Rev @ Epoch: 163.88529960431

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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386. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-03-15 12:01:57 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-763732909@unomaha.edu>
Source record: 27990
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

```
Posted-By: auto-faq 3.2.1.2
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info,
and rec.radio.swap newsgroups. It is intended to serve as a guide for the new
reader on what to find where. Questions and comments may be directed to the
author, Jay Maynard, K5ZC, by Internet electronic mail at
jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September
1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to
note the rmgroup of rec.radio.amateur.packet, and to officially retire some
(in)famous threads of discussion on rec.radio.amateur.policy.

History
=======

Way back when, before there was a Usenet, the Internet hosted a mailing list
for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions
were held on the mailing list, and sent to the mailboxes of those who had
signed up for it. When the Usenet software was created, and net news as we
now know it was developed, a newsgroup was created for hams: net.ham-radio.
The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began
to dominate other topics in the group and on the list. This resulted in the
logical solution: a group was created to hold the packet discussion, and
another corresponding mailing list was created as well: net.ham-radio.packet
and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great
Renaming essentially unchanged, moving from net.ham-radio[.packet] to
rec.ham-radio[.packet]. Readership and volume grew with the rest of the
network.

The INFO-HAMS mailing list was originally run from a US Army computer at
White Sands Missile Range, SIMTEL20. There were few problems with this
arrangement, but one was that the system was not supposed to be used for
commercial purposes. Since one of hams' favorite pastimes is swapping
gear, it was natural for hams to post messages about equipment for sale
to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use
restriction, and after some argument, a group was created specifically
```

for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
===========================

Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

--
Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

387. Re: Antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-03-15 16:15:23 UTC
From: labelle@ornews.intel.com
Message-ID: <2m4mvc$gke@ornews.intel.com>
Source record: 27991

gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>Yes! The KLM22C and 40CX are that great. When used with the optional
>fiberglass crossboom, the two antennas boresite to the same point in
>space, the feed networks are good, they're more or less immune to
>environmental issues like rain and ice, and antenna mechanical construction
>is sound. (The extra gain over the AOP package doesn't hurt either.)

I had the AOP package and it worked fine, except when the satellite
was marginal. I had a 100W amp and this did not help the strength
of the uplink. Downlink is OK and aided with an in-shack GaAs
preamp. I upgraded to the 40CX which degraded with time. Turned out
the minibox housing the relay was not entirely sealed, filled with
water and ruined the SWR/performance. Make sure that box is well
sealed! I'm still using the AOP 2M ant. for receive.

George
WB6YZZ

388. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-03-16 01:20:55 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.763780855@afit.af.mil>
Source record: 27992
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 62
1 23025U 94015A 94074.33333333 .00005709 54906-5 10233-4 0 296
2 23025 39.0152 177.8801 0007067 267.5157 289.9591 16.05040061 1714
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

389. New GPS newsgroup

Newsgroup: rec.radio.amateur.space
Date: 1994-03-16 01:47:30 UTC
From: rwilkins@ccnet.com
Message-ID: <2m5ofi$pmt@ccnet.ccnet.com>
Source record: 27993

You may want to point your newsreader toward sci.geo.satellite-nav

Bob

--
Bob Wilkins work bwilkins@cave.org
Berkeley, California home rwilkins@ccnet.com
94701-0710 play n6fri@n6eeg.#nocal.usa.noam

390. STS-62 Orbital State Vectors Rev #192 (Post OMS-5)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-16 20:37:37 UTC
From: astroman@netcom.com
Message-ID: <astromanCMryMp.MpJ@netcom.com>
Source record: 27994
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-62
Catalog Number: 23025 94015A
Epoch Date/Time: 94075.54456847222
03/16/1994 13:04:10.716 UTC
EFG E: -21105131.15 ft
F: 3277904.32 ft
G: 3420030.12 ft
Edot: -267.0319 ft/s
Fdot: -18720.8027 ft/s
Gdot: 15556.6230 ft/s
ndot/2 (drag): 0.00018121000 rev/day^2
nddt/6: 5.68420E-06 rev/day^3
Bstar: 1.05630E-05 1/Earth Radii
Elset #: 27
Rev @ Epoch: 192.04184367884

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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391. Re: GPS Receiver Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-16 22:46:20 UTC
From: miles@mbs.telesys.utexas.edu
Message-ID: <miles-160394164222@mac32.util.utexas.edu>
Source record: 27995

I have just arrived at this newsgroup, having been referred here from the GPS newsgroup "sci.geo.satellite-nav." Can someone fill me in on the details of this proposed group-buy of $150 GPS receivers?

Are the units hand-held or plug-in boards? Assembled? What model?

Thank you.

= = = = = = = = = = = = = = = = = = = =
_ Miles Abernathy, N5KOB =
| |__ miles@mbs.telesys.utexas.edu =
_| | POB 7580, Austin TX 78713 =
\ * / University of Texas @ Austin =
\/ tel. (512) 471-6521 U.S.A. =
= = = = = = = = = = = = = = = = = = = =

392. GPS Boards

Newsgroup: rec.radio.amateur.space
Date: 1994-03-16 22:56:16 UTC
From: Iver@matt.ksu.ksu.edu
Message-ID: <2m82qg$chs@matt.ksu.ksu.edu>
Source record: 27996

I'm in if you're looking for 100 people to buy the
boards. Please get a post to state who we reply to.
thnks

393. STS-62 Orbital State Vectors Rev #197

Newsgroup: rec.radio.amateur.space
Date: 1994-03-17 01:09:03 UTC
From: astroman@netcom.com
Message-ID: <astromanCMsB74.CM2@netcom.com>
Source record: 27997
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 7
Satellite Name: STS-62
Catalog Number: 23025 94015A
Epoch Date/Time: 94075.87564609954
03/16/1994 21:00:55.823 UTC
ECI X: 4674.088317 km
Y: -4010.028300 km
Z: 2345.249000 km
Xdot: 5.410363204 km/s
Ydot: 3.890003476 km/s
Zdot: -4.033196000 km/s
ndot/2 (drag): 0.00018486000 rev/day^2
nddt/6: 5.68830E-06 rev/day^3
Bstar: 1.06740E-05 1/Earth Radii
Elset #: 28
Rev @ Epoch: 197.40296291714

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

394. Re: Antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-03-17 13:49:23 UTC
From: mallick@crd.ge.com
Message-ID: <CMtAEB.4Lx@crdnns.crd.ge.com>
Source record: 27998

I have the Hy-Gain "Oscar-Link" antenna array and it seemed to work quite well for me. I made a couple of contacts through AO-13 with my Ten-Tec 2510B running barefoot (10 Watts out). No problem hearing the bird either. I can't say too much about durability, since I took the antennas off of their temporary "armstrong" mount at the end of the summer. Hope to have a permanent setup soon.

--
....
John A. Mallick WA1HNL E-mail: mallick@crd.ge.com
GE Corporate Research and Development Phone: (518)-387-7667 (W)
Schenectady, NY 12301 FAX: (518)-387-6560 (W)
....

"Work like hell. Tell everyone everything you know. Close a deal with a handshake. Have fun." --- "Doc" Edgerton

395. orbs$077.oscar.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 05:15:48 UTC
From: ray.hoad@pubcon.fort-worth.tx.us
Message-ID: <940318061008534@pubcon.fort-worth.tx.us>
Source record: 27999

```
SB KEPS @ AMSAT $ORBS-077.O
Orbital Elements 077.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94074.03621199
Element set: 269
Inclination: 27.1901 deg
RA of node: 337.1540 deg
Eccentricity: 0.6022168
Arg of perigee: 162.1847 deg
Mean anomaly: 234.6755 deg
Mean motion: 2.05878068 rev/day
Decay rate: -1.07e-06 rev/day^2
Epoch rev: 8084
Checksum: 302

Satellite: UO-11
Catalog number: 14781
Epoch time: 94076.08262229
Element set: 674
Inclination: 97.7911 deg
RA of node: 95.1034 deg
Eccentricity: 0.0010946
Arg of perigee: 200.8625 deg
Mean anomaly: 159.2135 deg
Mean motion: 14.69171604 rev/day
Decay rate: 3.87e-06 rev/day^2
Epoch rev: 53678
Checksum: 318

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94075.40199974
Element set: 882
Inclination: 82.9231 deg
RA of node: 37.4191 deg
Eccentricity: 0.0010266
Arg of perigee: 287.1702 deg
Mean anomaly: 72.8326 deg
```

Mean motion: 13.72333370 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 33718
Checksum: 300

Satellite: AO-13
Catalog number: 19216
Epoch time: 94072.40935734
Element set: 893
Inclination: 57.8759 deg
RA of node: 263.4718 deg
Eccentricity: 0.7210812
Arg of perigee: 336.8024 deg
Mean anomaly: 2.5676 deg
Mean motion: 2.09719189 rev/day
Decay rate: 1.66e-06 rev/day^2
Epoch rev: 4400
Checksum: 322

Satellite: FO-20
Catalog number: 20480
Epoch time: 94071.45658699
Element set: 668
Inclination: 99.0216 deg
RA of node: 241.6090 deg
Eccentricity: 0.0540420
Arg of perigee: 198.5456 deg
Mean anomaly: 159.5252 deg
Mean motion: 12.83224395 rev/day
Decay rate: -2.1e-07 rev/day^2
Epoch rev: 19172
Checksum: 314

Satellite: AO-21
Catalog number: 21087
Epoch time: 94072.89324047
Element set: 444
Inclination: 82.9367 deg
RA of node: 213.2088 deg
Eccentricity: 0.0035958
Arg of perigee: 352.1754 deg
Mean anomaly: 7.8836 deg
Mean motion: 13.74535804 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 15649
Checksum: 329

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94075.53910009
Element set: 672

Inclination: 82.9174 deg
RA of node: 80.1605 deg
Eccentricity: 0.0030126
Arg of perigee: 9.5405 deg
Mean anomaly: 350.6312 deg
Mean motion: 13.74037277 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 15592
Checksum: 286

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94064.50000000
Element set: 246
Inclination: 1.6510 deg
RA of node: 105.2680 deg
Eccentricity: 0.2927552
Arg of perigee: 173.8780 deg
Mean anomaly: 198.1380 deg
Mean motion: 1.42201225 rev/day
Decay rate: -1.19e-06 rev/day^2
Epoch rev: 299
Checksum: 250

/EX

396. orbs$077.micro.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 05:17:44 UTC
From: ray.hoad@pubcon.fort-worth.tx.us
Message-ID: <940318061008535@pubcon.fort-worth.tx.us>
Source record: 28000

```
SB KEPS @ AMSAT $ORBS-077.D
Orbital Elements 077.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94072.21549149
Element set: 973
Inclination: 98.5925 deg
RA of node: 158.2846 deg
Eccentricity: 0.0011701
Arg of perigee: 110.0876 deg
Mean anomaly: 250.1559 deg
Mean motion: 14.29829808 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 21587
Checksum: 323

Satellite: AO-16
Catalog number: 20439
Epoch time: 94076.19336562
Element set: 774
Inclination: 98.6002 deg
RA of node: 163.3475 deg
Eccentricity: 0.0012127
Arg of perigee: 99.9777 deg
Mean anomaly: 260.2776 deg
Mean motion: 14.29885704 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 21645
Checksum: 337

Satellite: DO-17
Catalog number: 20440
Epoch time: 94076.22662674
Element set: 773
Inclination: 98.6015 deg
RA of node: 163.6736 deg
Eccentricity: 0.0012240
Arg of perigee: 99.1450 deg
Mean anomaly: 261.1119 deg
```

Mean motion: 14.30024568 rev/day
Decay rate: 7.4e-07 rev/day^2
Epoch rev: 21647
Checksum: 290

Satellite: WO-18
Catalog number: 20441
Epoch time: 94072.21203773
Element set: 774
Inclination: 98.6013 deg
RA of node: 159.7138 deg
Eccentricity: 0.0012829
Arg of perigee: 111.2783 deg
Mean anomaly: 248.9762 deg
Mean motion: 14.29998941 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 21590
Checksum: 327

Satellite: LO-19
Catalog number: 20442
Epoch time: 94076.18464293
Element set: 773
Inclination: 98.6015 deg
RA of node: 163.8733 deg
Eccentricity: 0.0013183
Arg of perigee: 99.4776 deg
Mean anomaly: 260.7899 deg
Mean motion: 14.30094641 rev/day
Decay rate: 8.0e-07 rev/day^2
Epoch rev: 21648
Checksum: 333

Satellite: UO-22
Catalog number: 21575
Epoch time: 94075.24420930
Element set: 475
Inclination: 98.4400 deg
RA of node: 151.5895 deg
Eccentricity: 0.0007108
Arg of perigee: 202.4817 deg
Mean anomaly: 157.6059 deg
Mean motion: 14.36899328 rev/day
Decay rate: 9.7e-07 rev/day^2
Epoch rev: 13973
Checksum: 324

Satellite: KO-23
Catalog number: 22077
Epoch time: 94076.18255996
Element set: 370

Inclination: 66.0833 deg
RA of node: 112.6185 deg
Eccentricity: 0.0011519
Arg of perigee: 310.3641 deg
Mean anomaly: 49.6367 deg
Mean motion: 12.86285535 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7495
Checksum: 316

Satellite: AO-27
Catalog number: 22825
Epoch time: 94072.21774410
Element set: 270
Inclination: 98.6611 deg
RA of node: 148.9612 deg
Eccentricity: 0.0009401
Arg of perigee: 126.7150 deg
Mean anomaly: 233.4895 deg
Mean motion: 14.27613170 rev/day
Decay rate: 1.13e-06 rev/day^2
Epoch rev: 2399
Checksum: 287

Satellite: IO-26
Catalog number: 22826
Epoch time: 94072.20569811
Element set: 270
Inclination: 98.6611 deg
RA of node: 148.9734 deg
Eccentricity: 0.0009962
Arg of perigee: 126.0055 deg
Mean anomaly: 234.2050 deg
Mean motion: 14.27715988 rev/day
Decay rate: 1.34e-06 rev/day^2
Epoch rev: 2399
Checksum: 312

Satellite: KO-25
Catalog number: 22830
Epoch time: 94076.16166154
Element set: 274
Inclination: 98.5601 deg
RA of node: 151.1197 deg
Eccentricity: 0.0012546
Arg of perigee: 85.4566 deg
Mean anomaly: 274.8057 deg
Mean motion: 14.28040646 rev/day
Decay rate: 7.7e-07 rev/day^2
Epoch rev: 2456
Checksum: 307

/EX

397. orbs$077.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 05:20:36 UTC
From: ray.hoad@pubcon.fort-worth.tx.us
Message-ID: <940318061008536@pubcon.fort-worth.tx.us>
Source record: 28001

```
SB KEPS @ AMSAT $ORBS-077.W
Orbital Elements 077.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94074.03402688
Element set: 750
Inclination: 99.0656 deg
RA of node: 123.3704 deg
Eccentricity: 0.0015705
Arg of perigee: 122.8642 deg
Mean anomaly: 237.4045 deg
Mean motion: 14.13597974 rev/day
Decay rate: 1.26e-06 rev/day^2
Epoch rev: 47704
Checksum: 309

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94073.99072129
Element set: 647
Inclination: 98.5121 deg
RA of node: 85.8616 deg
Eccentricity: 0.0012156
Arg of perigee: 244.1267 deg
Mean anomaly: 115.8662 deg
Mean motion: 14.24872785 rev/day
Decay rate: 1.08e-06 rev/day^2
Epoch rev: 38919
Checksum: 338

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94076.18240290
Element set: 272
Inclination: 82.5456 deg
RA of node: 341.7797 deg
Eccentricity: 0.0018514
Arg of perigee: 79.0102 deg
Mean anomaly: 281.3131 deg
```

Mean motion: 13.84711418 rev/day
Decay rate: 1.27e-06 rev/day^2
Epoch rev: 30962
Checksum: 295

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94072.89393314
Element set: 268
Inclination: 82.5411 deg
RA of node: 31.1102 deg
Eccentricity: 0.0017651
Arg of perigee: 137.2192 deg
Mean anomaly: 223.0298 deg
Mean motion: 13.16965600 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27071
Checksum: 276

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94073.96248747
Element set: 559
Inclination: 99.1660 deg
RA of node: 60.5963 deg
Eccentricity: 0.0012728
Arg of perigee: 40.9981 deg
Mean anomaly: 319.2144 deg
Mean motion: 14.12967309 rev/day
Decay rate: 8.6e-07 rev/day^2
Epoch rev: 28191
Checksum: 333

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94075.85339731
Element set: 271
Inclination: 82.5182 deg
RA of node: 217.5195 deg
Eccentricity: 0.0015409
Arg of perigee: 122.8587 deg
Mean anomaly: 237.3935 deg
Mean motion: 13.84358686 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 25491
Checksum: 342

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94075.88142870
Element set: 4

Inclination: 82.5576 deg
RA of node: 333.8085 deg
Eccentricity: 0.0006499
Arg of perigee: 152.2875 deg
Mean anomaly: 207.8581 deg
Mean motion: 13.04425109 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21086
Checksum: 300

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94075.63449506
Element set: 773
Inclination: 82.5434 deg
RA of node: 281.9855 deg
Eccentricity: 0.0017468
Arg of perigee: 47.7992 deg
Mean anomaly: 312.4642 deg
Mean motion: 13.84190213 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18781
Checksum: 330

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94076.22426307
Element set: 919
Inclination: 98.8393 deg
RA of node: 99.2948 deg
Eccentricity: 0.0013308
Arg of perigee: 265.4548 deg
Mean anomaly: 94.5096 deg
Mean motion: 14.01312219 rev/day
Decay rate: -1.72e-06 rev/day^2
Epoch rev: 18082
Checksum: 326

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94071.91097536
Element set: 781
Inclination: 82.5228 deg
RA of node: 222.5667 deg
Eccentricity: 0.0012920
Arg of perigee: 323.8660 deg
Mean anomaly: 36.1626 deg
Mean motion: 13.83574515 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 17444
Checksum: 309

Satellite: MET-3/4
Catalog number: 21232

398. orbs$077.misc.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 05:22:06 UTC
From: ray.hoad@pubcon.fort-worth.tx.us
Message-ID: <940318061009537@pubcon.fort-worth.tx.us>
Source record: 28002

```
SB KEPS @ AMSAT $ORBS-077.M
Orbital Elements 077.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94072.24139185
Element set: 263
Inclination: 98.6566 deg
RA of node: 149.0227 deg
Eccentricity: 0.0010769
Arg of perigee: 114.2722 deg
Mean anomaly: 245.9582 deg
Mean motion: 14.28010738 rev/day
Decay rate: 7.3e-07 rev/day^2
Epoch rev: 2400
Checksum: 291

Satellite: MIR
Catalog number: 16609
Epoch time: 94075.82181288
Element set: 177
Inclination: 51.6463 deg
RA of node: 289.2936 deg
Eccentricity: 0.0015053
Arg of perigee: 41.3927 deg
Mean anomaly: 318.8353 deg
Mean motion: 15.58193902 rev/day
Decay rate: 7.619e-05 rev/day^2
Epoch rev: 46164
Checksum: 330

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94073.54142216
Element set: 457
Inclination: 28.4691 deg
RA of node: 123.9060 deg
Eccentricity: 0.0006308
Arg of perigee: 177.0781 deg
Mean anomaly: 182.9845 deg
```

Mean motion: 14.90525553 rev/day
Decay rate: 1.087e-05 rev/day^2
Epoch rev: 1525
Checksum: 291

Satellite: GRO
Catalog number: 21225
Epoch time: 94074.15950667
Element set: 73
Inclination: 28.4604 deg
RA of node: 164.6497 deg
Eccentricity: 0.0003468
Arg of perigee: 223.7721 deg
Mean anomaly: 136.2602 deg
Mean motion: 15.40375395 rev/day
Decay rate: 5.538e-05 rev/day^2
Epoch rev: 4242
Checksum: 294

Satellite: UARS
Catalog number: 21701
Epoch time: 94076.25976255
Element set: 487
Inclination: 56.9834 deg
RA of node: 167.4368 deg
Eccentricity: 0.0004269
Arg of perigee: 96.1849 deg
Mean anomaly: 263.9671 deg
Mean motion: 14.96533180 rev/day
Decay rate: 2.830e-05 rev/day^2
Epoch rev: 13717
Checksum: 339

/EX

399. orbs$077.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 05:23:54 UTC
From: ray.hoad@pubcon.fort-worth.tx.us
Message-ID: <940318061009538@pubcon.fort-worth.tx.us>
Source record: 28003

```
SB KEPS @ AMSAT $ORBS-077.N
2Line Orbital Elements 077.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94074.03621199 -.00000107 00000-0 10000-3 0 2699
2 14129 27.1901 337.1540 6022168 162.1847 234.6755 2.05878068 80842
UO-11
1 14781U 84021B 94076.08262229 .00000387 00000-0 73489-4 0 6746
2 14781 97.711 95.1034 0010946 200.8625 159.2135 14.69171604536786
RS-10/11
1 18129U 87054A 94075.40199974 .00000041 00000-0 28565-4 0 8829
2 18129 82.9231 37.4191 0010266 287.1702 72.8326 13.72333370337187
AO-13
1 19216U 88051B 94072.40935734 .00000166 00000-0 10000-4 0 8939
2 19216 57.8759 263.4718 7210812 336.8024 2.5676 2.09719189 44000
FO-20
1 20480U 90013C 94071.45658699 -.00000021 00000-0 25451-4 0 6688
2 20480 99.0216 241.6090 0540420 198.5456 159.5252 12.83224395191726
AO-21
1 21087U 91006A 94072.89324047 .00000094 00000-0 82657-4 0 4443
2 21087 82.9367 213.2088 0035958 352.1754 7.8836 13.74535804156493
RS-12/13
1 21089U 91007A 94075.53910009 .00000057 00000-0 44794-4 0 6721
2 21089 82.9174 80.1605 0030126 9.5405 350.6312 13.74037277155921
ARSENE
1 22654U 93031B 94064.50000000 -.00000119 00000-0 00000 0 0 2469
2 22654 1.6510 105.2680 2927552 173.8780 198.1380 1.42201225 2991
UO-14
1 20437U 90005B 94072.21549149 .00000072 00000-0 44764-4 0 9737
2 20437 98.5925 158.2846 0011701 110.0876 250.1559 14.29829808215874
AO-16
1 20439U 90005D 94076.19336562 .0000005 00000-0 42387-4 0 7743
2 20439 98.6002 163.3475 0012127 99.9777 260.2776 14.29885704216451
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DO-17
1 20440U 90005E 94076.22662674 .00000074 00000-0 45623-4 0 7730
2 20440 98.6015 163.6736 0012240 99.1450 261.1119 14.30024568216474
WO-18
1 20441U 90005F 94072.21203773 .00000059 00000-0 39794-4 0 7743
2 20441 98.6013 159.7138 0012829 111.2783 248.9762 14.29998941215900
LO-19
1 20442U 90005G 94076.18464293 .00000080 00000-0 47723-4 0 7734
2 20442 98.6015 163.8733 0013183 99.4776 260.7899 14.30094641216486
UO-22
1 21575U 91050B 94075.24420930 .00000097 00000-0 47355-4 0 4757
2 21575 98.4400 151.5895 0007108 202.4817 157.6059 14.36899328139730
KO-23
1 22077U 92052B 94076.18255996 -.00000037 00000-0 10000-3 0 3705
2 22077 66.0833 112.6185 0011519 310.3641 49.6367 12.86285535 74950
AO-27
1 22825U 93061C 94072.21774410 .00000113 00000-0 63718-4 0 2702
2 22825 98.6611 148.9612 0009401 126.7150 233.4895 14.27613170 23998
IO-26
1 22826U 93061D 94072.20569811 .00000134 00000-0 71926-4 0 2702
2 22826 98.6611 148.9734 0009962 126.0055 234.2050 14.27715988 23995
KO-25
1 22830U 93061H 94076.16166154 .00000077 00000-0 48244-4 0 2746
2 22830 98.5601 151.1197 0012546 85.4566 274.8057 14.28040646 24568
NOAA-9
1 15427U 84123A 94074.03402688 .00000126 00000-0 90853-4 0 7505
2 15427 99.0656 123.3704 0015705 122.8642 237.4045 14.13597974477046
NOAA-10
1 16969U 86073A 94073.99072129 .00000108 00000-0 64636-4 0 6475
2 16969 98.5121 85.8616 0012156 244.1267 115.8662 14.24872785389191
MET-2/17
1 18820U 88005A 94076.18240290 .00000127 00000-0 99308-4 0 2729
2 18820 82.5456 341.7797 0018514 79.0102 281.3131 13.84711418309624
MET-3/2
1 19336U 88064A 94072.89393314 .00000051 00000-0 10000-3 0 2689
2 19336 82.5411 31.1102 0017651 137.2192 223.0298 13.16965600270718
NOAA-11
1 19531U 88089A 94073.96248747 .00000086 00000-0 71361-4 0 5590
2 19531 99.1660 60.5963 0012728 40.9981 319.2144 14.12967309281919
MET-2/18
1 19851U 89018A 94075.85339731 .00000027 00000-0 10933-4 0 2716
2 19851 82.5182 217.5195 0015409 122.8587 237.3935 13.84358686254919
MET-3/3
1 20305U 89086A 94075.8812870 .00000044 00000-0 10000-3 0 43
2 20305 82.5576 333.8085 0006499 152.2875 207.8581 13.04425109210860
MET-2/19
1 20670U 90057A 94075.63449506 .00000024 00000-0 79036-5 0 7734
2 20670 82.5434 281.9855 0017468 47.7992 312.4642 13.84190213187814
FY-1/2
1 20788U 90081A 94076.22426307 -.00000172 00000-0 -85968-4 0 9199
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2 20788 98.8393 99.2948 0013308 265.4548 94.5096 14.01312219180823
MET-2/20
1 20826U 90086A 94071.91097536 .00000059 00000-0 40218-4 0 7814
2 20826 82.5228 222.5667 0012920 323.8660 36.1626 13.83574515174445
MET-3/4
1 21232U 91030A 94071.87651682 .00000051 00000-0 10000-3 0 6792
2 21232 82.5362 237.6665 0014715 65.8899 294.3776 13.16460820138681
NOAA-12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
MET-3/5
1 21655U 91056A 94076.19735930 .00000051 00000-0 10000-3 0 6877
2 21655 82.5556 181.6999 0014730 67.7742 292.4937 13.16828055124353
MET-2/21
1 22782U 93055A 94072.07378319 .00000044 00000-0 26732-4 0 2819
2 22782 82.5479 282.6058 0022877 131.3043 229.0093 13.83002641 26809
POSAT
1 22829U 93061G 94072.24139185 .00000073 00000-0 47209-4 0 2637
2 22829 98.6566 149.0227 0010769 114.2722 245.9582 14.28010738 24007
MIR
1 16609U 86017A 94075.82181288 .00007619 00000-0 10511-3 0 1779
2 16609 51.6463 289.2936 0015053 41.3927 318.8353 15.58193902461643
HUBBLE
1 20580U 90037B 94073.54142216 .00001087 00000-0 93515-4 0 4574
2 20580 28.4691 123.9060 0006308 177.0781 182.9845 14.90525553 15255
GRO
1 21225U 91027B 94074.15950667 .00005538 00000-0 12661-3 0 737
2 21225 28.4604 164.6497 0003468 223.7721 136.2602 15.40375395 42424
UARS
1 21701U 91063B 94076.25976255 .00002830 00000-0 26775-3 0 4872
2 21701 56.9834 167.4368 0004269 96.1849 263.9671 14.96533180137174
/EX
```

400. orbs$077.weath2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 05:28:36 UTC
From: ray.hoad@pubcon.fort-worth.tx.us
Message-ID: <940318061009539@pubcon.fort-worth.tx.us>
Source record: 28004

Sorry the line limit got me on the message upload. Here is the rest of
the AMSAT format weather satellite keps .....

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94071.87651682
Element set: 679
Inclination: 82.5362 deg
RA of node: 237.6665 deg
Eccentricity: 0.0014715
Arg of perigee: 65.8899 deg
Mean anomaly: 294.3776 deg
Mean motion: 13.16460820 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13868
Checksum: 339

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94074.00396538
Element set: 964
Inclination: 98.6278 deg
RA of node: 103.8182 deg
Eccentricity: 0.0013418
Arg of perigee: 145.8585 deg
Mean anomaly: 214.3456 deg
Mean motion: 14.22379795 rev/day
Decay rate: 1.80e-06 rev/day^2
Epoch rev: 14714
Checksum: 320

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94076.19735930
Element set: 687
Inclination: 82.5556 deg
RA of node: 181.6999 deg
Eccentricity: 0.0014730
Arg of perigee: 67.7742 deg
Mean anomaly: 292.4937 deg
Mean motion: 13.16828055 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12435
Checksum: 340

```
Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94072.07378319
Element set: 281
Inclination: 82.5479 deg
RA of node: 282.6058 deg
Eccentricity: 0.0022877
Arg of perigee: 131.3043 deg
Mean anomaly: 229.0093 deg
Mean motion: 13.83002641 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 2680
Checksum: 292

/EX
```

401. STS-62 Orbital State Vectors Rev #213

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 11:51:29 UTC
From: astroman@netcom.com
Message-ID: <astromanCMuzLt.C7C@netcom.com>
Source record: 28005
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 7
Satellite Name: STS-62
Catalog Number: 23025 94015A
Epoch Date/Time: 94076.87599879630
03/17/1994 21:01:26.296 UTC
ECI X: 5973.402703 km
Y: 1257.663741 km
Z: -2568.909000 km
Xdot: -2.902954216 km/s
Ydot: 6.064090743 km/s
Zdot: -3.854155000 km/s
ndot/2 (drag): 0.00018636000 rev/day^2
nddt/6: 5.69570E-06 rev/day^3
Bstar: 1.03740E-05 1/Earth Radii
Elset #: 30
Rev @ Epoch: 213.60447972141

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

402. STS-62 Element Set (94076.715)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 12:45:35 UTC
From: elements-request@alsys.com
Message-ID: <STS-62.94076.715@alsys.com>
Source record: 28006
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-62
1 23025U 94015A 94076.71529834 .00018636 56957-5 10374-4 0 379
2 23025 39.0169 161.6728 0041468 89.9025 270.6543 16.17267385 2116

Satellite: STS-62
Catalog number: 23025
Epoch time: 94076.71529834 (17 MAR 94 17:10:01.78 UTC)
Element set: GSFC-037
Inclination: 39.0169 deg
RA of node: 161.6728 deg Space Shuttle Flight STS-62
Eccentricity: 0.0041468 Keplerian Elements
Arg of perigee: 89.9025 deg
Mean anomaly: 270.6543 deg
Mean motion: 16.17267385 rev/day Semi-major Axis: 6605.1139 Km
Decay rate: 0.19E-03 rev/day*2 Apogee Alt: 254.12 Km
Epoch rev: 211 Perigee Alt: 199.34 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris KK6YB Internet: elements-request@alsys.com
San Diego, CA, USA Phone: +1 619-457-2700
```

403. ORBS$077.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 13:28:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-077.o.1994@ampr.org>
Source record: 28007
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-077.O
Orbital Elements 077.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94074.03621199
Element set: 269
Inclination: 27.1901 deg
RA of node: 337.1540 deg
Eccentricity: 0.6022168
Arg of perigee: 162.1847 deg
Mean anomaly: 234.6755 deg
Mean motion: 2.05878068 rev/day
Decay rate: -1.07e-06 rev/day^2
Epoch rev: 8084
Checksum: 302

Satellite: UO-11
Catalog number: 14781
Epoch time: 94076.08262229
Element set: 674
Inclination: 97.7911 deg
RA of node: 95.1034 deg
Eccentricity: 0.0010946
Arg of perigee: 200.8625 deg
Mean anomaly: 159.2135 deg
Mean motion: 14.69171604 rev/day
Decay rate: 3.87e-06 rev/day^2
Epoch rev: 53678
Checksum: 318

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94075.40199974
Element set: 882
Inclination: 82.9231 deg
RA of node: 37.4191 deg
Eccentricity: 0.0010266
Arg of perigee: 287.1702 deg
```

Mean anomaly: 72.8326 deg
Mean motion: 13.72333370 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 33718
Checksum: 300

Satellite: AO-13
Catalog number: 19216
Epoch time: 94072.40935734
Element set: 893
Inclination: 57.8759 deg
RA of node: 263.4718 deg
Eccentricity: 0.7210812
Arg of perigee: 336.8024 deg
Mean anomaly: 2.5676 deg
Mean motion: 2.09719189 rev/day
Decay rate: 1.66e-06 rev/day^2
Epoch rev: 4400
Checksum: 322

Satellite: FO-20
Catalog number: 20480
Epoch time: 94071.45658699
Element set: 668
Inclination: 99.0216 deg
RA of node: 241.6090 deg
Eccentricity: 0.0540420
Arg of perigee: 198.5456 deg
Mean anomaly: 159.5252 deg
Mean motion: 12.83224395 rev/day
Decay rate: -2.1e-07 rev/day^2
Epoch rev: 19172
Checksum: 314

Satellite: AO-21
Catalog number: 21087
Epoch time: 94072.89324047
Element set: 444
Inclination: 82.9367 deg
RA of node: 213.2088 deg
Eccentricity: 0.0035958
Arg of perigee: 352.1754 deg
Mean anomaly: 7.8836 deg
Mean motion: 13.74535804 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 15649
Checksum: 329

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94075.53910009

Element set: 672
Inclination: 82.9174 deg
RA of node: 80.1605 deg
Eccentricity: 0.0030126
Arg of perigee: 9.5405 deg
Mean anomaly: 350.6312 deg
Mean motion: 13.74037277 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 15592
Checksum: 286

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94064.50000000
Element set: 246
Inclination: 1.6510 deg
RA of node: 105.2680 deg
Eccentricity: 0.2927552
Arg of perigee: 173.8780 deg
Mean anomaly: 198.1380 deg
Mean motion: 1.42201225 rev/day
Decay rate: -1.19e-06 rev/day^2
Epoch rev: 299
Checksum: 250

/EX

404. ORBS$077.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 13:31:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-077.d.1994@ampr.org>
Source record: 28008
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-077.D
Orbital Elements 077.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94072.21549149
Element set: 973
Inclination: 98.5925 deg
RA of node: 158.2846 deg
Eccentricity: 0.0011701
Arg of perigee: 110.0876 deg
Mean anomaly: 250.1559 deg
Mean motion: 14.29829808 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 21587
Checksum: 323

Satellite: AO-16
Catalog number: 20439
Epoch time: 94076.19336562
Element set: 774
Inclination: 98.6002 deg
RA of node: 163.3475 deg
Eccentricity: 0.0012127
Arg of perigee: 99.9777 deg
Mean anomaly: 260.2776 deg
Mean motion: 14.29885704 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 21645
Checksum: 337

Satellite: DO-17
Catalog number: 20440
Epoch time: 94076.22662674
Element set: 773
Inclination: 98.6015 deg
RA of node: 163.6736 deg
Eccentricity: 0.0012240
Arg of perigee: 99.1450 deg
```

Mean anomaly: 261.1119 deg
Mean motion: 14.30024568 rev/day
Decay rate: 7.4e-07 rev/day^2
Epoch rev: 21647
Checksum: 290

Satellite: WO-18
Catalog number: 20441
Epoch time: 94072.21203773
Element set: 774
Inclination: 98.6013 deg
RA of node: 159.7138 deg
Eccentricity: 0.0012829
Arg of perigee: 111.2783 deg
Mean anomaly: 248.9762 deg
Mean motion: 14.29998941 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 21590
Checksum: 327

Satellite: LO-19
Catalog number: 20442
Epoch time: 94076.18464293
Element set: 773
Inclination: 98.6015 deg
RA of node: 163.8733 deg
Eccentricity: 0.0013183
Arg of perigee: 99.4776 deg
Mean anomaly: 260.7899 deg
Mean motion: 14.30094641 rev/day
Decay rate: 8.0e-07 rev/day^2
Epoch rev: 21648
Checksum: 333

Satellite: UO-22
Catalog number: 21575
Epoch time: 94075.24420930
Element set: 475
Inclination: 98.4400 deg
RA of node: 151.5895 deg
Eccentricity: 0.0007108
Arg of perigee: 202.4817 deg
Mean anomaly: 157.6059 deg
Mean motion: 14.36899328 rev/day
Decay rate: 9.7e-07 rev/day^2
Epoch rev: 13973
Checksum: 324

Satellite: KO-23
Catalog number: 22077
Epoch time: 94076.18255996

Element set: 370
Inclination: 66.0833 deg
RA of node: 112.6185 deg
Eccentricity: 0.0011519
Arg of perigee: 310.3641 deg
Mean anomaly: 49.6367 deg
Mean motion: 12.86285535 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7495
Checksum: 316

Satellite: AO-27
Catalog number: 22825
Epoch time: 94072.21774410
Element set: 270
Inclination: 98.6611 deg
RA of node: 148.9612 deg
Eccentricity: 0.0009401
Arg of perigee: 126.7150 deg
Mean anomaly: 233.4895 deg
Mean motion: 14.27613170 rev/day
Decay rate: 1.13e-06 rev/day^2
Epoch rev: 2399
Checksum: 287

Satellite: IO-26
Catalog number: 22826
Epoch time: 94072.20569811
Element set: 270
Inclination: 98.6611 deg
RA of node: 148.9734 deg
Eccentricity: 0.0009962
Arg of perigee: 126.0055 deg
Mean anomaly: 234.2050 deg
Mean motion: 14.27715988 rev/day
Decay rate: 1.34e-06 rev/day^2
Epoch rev: 2399
Checksum: 312

Satellite: KO-25
Catalog number: 22830
Epoch time: 94076.16166154
Element set: 274
Inclination: 98.5601 deg
RA of node: 151.1197 deg
Eccentricity: 0.0012546
Arg of perigee: 85.4566 deg
Mean anomaly: 274.8057 deg
Mean motion: 14.28040646 rev/day
Decay rate: 7.7e-07 rev/day^2
Epoch rev: 2456

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Checksum: 307

/EX
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405. ORBS$077.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 13:34:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-077.w.1994@ampr.org>
Source record: 28009
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-077.W
Orbital Elements 077.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94074.03402688
Element set: 750
Inclination: 99.0656 deg
RA of node: 123.3704 deg
Eccentricity: 0.0015705
Arg of perigee: 122.8642 deg
Mean anomaly: 237.4045 deg
Mean motion: 14.13597974 rev/day
Decay rate: 1.26e-06 rev/day^2
Epoch rev: 47704
Checksum: 309

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94073.99072129
Element set: 647
Inclination: 98.5121 deg
RA of node: 85.8616 deg
Eccentricity: 0.0012156
Arg of perigee: 244.1267 deg
Mean anomaly: 115.8662 deg
Mean motion: 14.24872785 rev/day
Decay rate: 1.08e-06 rev/day^2
Epoch rev: 38919
Checksum: 338

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94076.18240290
Element set: 272
Inclination: 82.5456 deg
RA of node: 341.7797 deg
Eccentricity: 0.0018514
Arg of perigee: 79.0102 deg
```

Mean anomaly: 281.3131 deg
Mean motion: 13.84711418 rev/day
Decay rate: 1.27e-06 rev/day^2
Epoch rev: 30962
Checksum: 295

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94072.89393314
Element set: 268
Inclination: 82.5411 deg
RA of node: 31.1102 deg
Eccentricity: 0.0017651
Arg of perigee: 137.2192 deg
Mean anomaly: 223.0298 deg
Mean motion: 13.16965600 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27071
Checksum: 276

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94073.96248747
Element set: 559
Inclination: 99.1660 deg
RA of node: 60.5963 deg
Eccentricity: 0.0012728
Arg of perigee: 40.9981 deg
Mean anomaly: 319.2144 deg
Mean motion: 14.12967309 rev/day
Decay rate: 8.6e-07 rev/day^2
Epoch rev: 28191
Checksum: 333

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94075.85339731
Element set: 271
Inclination: 82.5182 deg
RA of node: 217.5195 deg
Eccentricity: 0.0015409
Arg of perigee: 122.8587 deg
Mean anomaly: 237.3935 deg
Mean motion: 13.84358686 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 25491
Checksum: 342

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94075.88142870

Element set: 4
Inclination: 82.5576 deg
RA of node: 333.8085 deg
Eccentricity: 0.0006499
Arg of perigee: 152.2875 deg
Mean anomaly: 207.8581 deg
Mean motion: 13.04425109 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21086
Checksum: 300

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94075.63449506
Element set: 773
Inclination: 82.5434 deg
RA of node: 281.9855 deg
Eccentricity: 0.0017468
Arg of perigee: 47.7992 deg
Mean anomaly: 312.4642 deg
Mean motion: 13.84190213 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18781
Checksum: 330

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94076.22426307
Element set: 919
Inclination: 98.8393 deg
RA of node: 99.2948 deg
Eccentricity: 0.0013308
Arg of perigee: 265.4548 deg
Mean anomaly: 94.5096 deg
Mean motion: 14.01312219 rev/day
Decay rate: -1.72e-06 rev/day^2
Epoch rev: 18082
Checksum: 326

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94071.91097536
Element set: 781
Inclination: 82.5228 deg
RA of node: 222.5667 deg
Eccentricity: 0.0012920
Arg of perigee: 323.8660 deg
Mean anomaly: 36.1626 deg
Mean motion: 13.83574515 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 17444

Checksum: 309

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94071.87651682
Element set: 679
Inclination: 82.5362 deg
RA of node: 237.6665 deg
Eccentricity: 0.0014715
Arg of perigee: 65.8899 deg
Mean anomaly: 294.3776 deg
Mean motion: 13.16460820 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13868
Checksum: 339

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94074.00396538
Element set: 964
Inclination: 98.6278 deg
RA of node: 103.8182 deg
Eccentricity: 0.0013418
Arg of perigee: 145.8585 deg
Mean anomaly: 214.3456 deg
Mean motion: 14.22379795 rev/day
Decay rate: 1.80e-06 rev/day^2
Epoch rev: 14714
Checksum: 320

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94076.19735930
Element set: 687
Inclination: 82.5556 deg
RA of node: 181.6999 deg
Eccentricity: 0.0014730
Arg of perigee: 67.7742 deg
Mean anomaly: 292.4937 deg
Mean motion: 13.16828055 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12435
Checksum: 340

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94072.07378319
Element set: 281
Inclination: 82.5479 deg
RA of node: 282.6058 deg
Eccentricity: 0.0022877

```
Arg of perigee: 131.3043 deg
Mean anomaly: 229.0093 deg
Mean motion: 13.83002641 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 2680
Checksum: 292

/EX
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406. ORBS$077.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 13:35:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-077.m.1994@ampr.org>
Source record: 28010
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-077.M
Orbital Elements 077.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94072.24139185
Element set: 263
Inclination: 98.6566 deg
RA of node: 149.0227 deg
Eccentricity: 0.0010769
Arg of perigee: 114.2722 deg
Mean anomaly: 245.9582 deg
Mean motion: 14.28010738 rev/day
Decay rate: 7.3e-07 rev/day^2
Epoch rev: 2400
Checksum: 291

Satellite: MIR
Catalog number: 16609
Epoch time: 94075.82181288
Element set: 177
Inclination: 51.6463 deg
RA of node: 289.2936 deg
Eccentricity: 0.0015053
Arg of perigee: 41.3927 deg
Mean anomaly: 318.8353 deg
Mean motion: 15.58193902 rev/day
Decay rate: 7.619e-05 rev/day^2
Epoch rev: 46164
Checksum: 330

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94073.54142216
Element set: 457
Inclination: 28.4691 deg
RA of node: 123.9060 deg
Eccentricity: 0.0006308
Arg of perigee: 177.0781 deg
```

Mean anomaly: 182.9845 deg
Mean motion: 14.90525553 rev/day
Decay rate: 1.087e-05 rev/day^2
Epoch rev: 1525
Checksum: 291

Satellite: GRO
Catalog number: 21225
Epoch time: 94074.15950667
Element set: 73
Inclination: 28.4604 deg
RA of node: 164.6497 deg
Eccentricity: 0.0003468
Arg of perigee: 223.7721 deg
Mean anomaly: 136.2602 deg
Mean motion: 15.40375395 rev/day
Decay rate: 5.538e-05 rev/day^2
Epoch rev: 4242
Checksum: 294

Satellite: UARS
Catalog number: 21701
Epoch time: 94076.25976255
Element set: 487
Inclination: 56.9834 deg
RA of node: 167.4368 deg
Eccentricity: 0.0004269
Arg of perigee: 96.1849 deg
Mean anomaly: 263.9671 deg
Mean motion: 14.96533180 rev/day
Decay rate: 2.830e-05 rev/day^2
Epoch rev: 13717
Checksum: 339

/EX

407. ORBS$077.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 13:38:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-077.n.1994@ampr.org>
Source record: 27661
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-077.N
2Line Orbital Elements 077.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX March 18, 1994
BID: $ORBS-077.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94074.03621199 -.00000107 00000-0 10000-3 0 2699
2 14129 27.1901 337.1540 6022168 162.1847 234.6755 2.05878068 80842
UO-11
1 14781U 84021B 94076.08262229 .00000387 00000-0 73489-4 0 6746
2 14781 97.7911 95.1034 0010946 200.8625 159.2135 14.69171604536786
RS-10/11
1 18129U 87054A 94075.40199974 .00000041 00000-0 28565-4 0 8829
2 18129 82.9231 37.4191 0010266 287.1702 72.8326 13.72333370337187
AO-13
1 19216U 88051B 94072.40935734 .00000166 00000-0 10000-4 0 8939
2 19216 57.8759 263.4718 7210812 336.8024 2.5676 2.09719189 44000
FO-20
1 20480U 90013C 94071.45658699 -.00000021 00000-0 25451-4 0 6688
2 20480 99.0216 241.6090 0540420 198.5456 159.5252 12.83224395191726
AO-21
1 21087U 91006A 94072.89324047 .00000094 00000-0 82657-4 0 4443
2 21087 82.9367 213.2088 0035958 352.1754 7.8836 13.74535804156493
RS-12/13
1 21089U 91007A 94075.53910009 .00000057 00000-0 44794-4 0 6721
2 21089 82.9174 80.1605 0030126 9.5405 350.6312 13.74037277155921
ARSENE
1 22654U 93031B 94064.50000000 -.00000119 00000-0 00000 0 0 2469
2 22654 1.6510 105.2680 2927552 173.8780 198.1380 1.42201225 2991
UO-14
1 20437U 90005B 94072.21549149 .00000072 00000-0 44764-4 0 9737
2 20437 98.5925 158.2846 0011701 110.0876 250.1559 14.29829808215874
AO-16
1 20439U 90005D 94076.19336562 .00000065 00000-0 42387-4 0 7743
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2 20439 98.6002 163.3475 0012127 99.9777 260.2776 14.29885704216451
DO-17
1 20440U 90005E 94076.22662674 .00000074 00000-0 45623-4 0 7730
2 20440 98.6015 163.6736 0012240 99.1450 261.1119 14.30024568216474
WO-18
1 20441U 90005F 94072.21203773 .00000059 00000-0 39794-4 0 7743
2 20441 98.6013 159.7138 0012829 111.2783 248.9762 14.29998941215900
LO-19
1 20442U 90005G 94076.18464293 .00000080 00000-0 47723-4 0 7734
2 20442 98.6015 163.8733 0013183 99.4776 260.7899 14.30094641216486
UO-22
1 21575U 91050B 94075.24420930 .00000097 00000-0 47355-4 0 4757
2 21575 98.4400 151.5895 0007108 202.4817 157.6059 14.36899328139730
KO-23
1 22077U 92052B 94076.18255996 -.00000037 00000-0 10000-3 0 3705
2 22077 66.0833 112.6185 0011519 310.3641 49.6367 12.86285535 74950
AO-27
1 22825U 93061C 94072.21774410 .00000113 00000-0 63718-4 0 2702
2 22825 98.6611 148.9612 0009401 126.7150 233.4895 14.27613170 23998
IO-26
1 22826U 93061D 94072.20569811 .00000134 00000-0 71926-4 0 2702
2 22826 98.6611 148.9734 0009962 126.0055 234.2050 14.27715988 23995
KO-25
1 22830U 93061H 94076.16166154 .00000077 00000-0 48244-4 0 2746
2 22830 98.5601 151.1197 0012546 85.4566 274.8057 14.28040646 24568
NOAA-9
1 15427U 84123A 94074.03402688 .00000126 00000-0 90853-4 0 7505
2 15427 99.0656 123.3704 0015705 122.8642 237.4045 14.13597974477046
NOAA-10
1 16969U 86073A 94073.99072129 .00000108 00000-0 64636-4 0 6475
2 16969 98.5121 85.8616 0012156 244.1267 115.8662 14.24872785389191
MET-2/17
1 18820U 88005A 94076.18240290 .00000127 00000-0 99308-4 0 2729
2 18820 82.5456 341.7797 0018514 79.0102 281.3131 13.84711418309624
MET-3/2
1 19336U 88064A 94072.89393314 .00000051 00000-0 10000-3 0 2689
2 19336 82.5411 31.1102 0017651 137.2192 223.0298 13.16965600270718
NOAA-11
1 19531U 88089A 94073.96248747 .00000086 00000-0 71361-4 0 5590
2 19531 99.1660 60.5963 0012728 40.9981 319.2144 14.12967309281919
MET-2/18
1 19851U 89018A 94075.85339731 .00000027 00000-0 10933-4 0 2716
2 19851 82.5182 217.5195 0015409 122.8587 237.3935 13.84358686254919
MET-3/3
1 20305U 89086A 94075.88142870 .00000044 00000-0 10000-3 0 43
2 20305 82.5576 333.8085 0006499 152.2875 207.8581 13.04425109210860
MET-2/19
1 20670U 90057A 94075.63449506 .00000024 00000-0 79036-5 0 7734
2 20670 82.5434 281.9855 0017468 47.7992 312.4642 13.84190213187814
FY-1/2
```

```
1 20788U 90081A 94076.22426307 -.00000172 00000-0 -85968-4 0 9199
2 20788 98.8393 99.2948 0013308 265.4548 94.5096 14.01312219180823
MET-2/20
1 20826U 90086A 94071.91097536 .00000059 00000-0 40218-4 0 7814
2 20826 82.5228 222.5667 0012920 323.8660 36.1626 13.83574515174445
MET-3/4
1 21232U 91030A 94071.87651682 .00000051 00000-0 10000-3 0 6792
2 21232 82.5362 237.6665 0014715 65.8899 294.3776 13.16460820138681
NOAA-12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
MET-3/5
1 21655U 91056A 94076.19735930 .00000051 00000-0 10000-3 0 6877
2 21655 82.5556 181.6999 0014730 67.7742 292.4937 13.16828055124353
MET-2/21
1 22782U 93055A 94072.07378319 .00000044 00000-0 26732-4 0 2819
2 22782 82.5479 282.6058 0022877 131.3043 229.0093 13.83002641 26809
POSAT
1 22829U 93061G 94072.24139185 .00000073 00000-0 47209-4 0 2637
2 22829 98.6566 149.0227 0010769 114.2722 245.9582 14.28010738 24007
MIR
1 16609U 86017A 94075.82181288 .00007619 00000-0 10511-3 0 1779
2 16609 51.6463 289.2936 0015053 41.3927 318.8353 15.58193902461643
HUBBLE
1 20580U 90037B 94073.54142216 .00001087 00000-0 93515-4 0 4574
2 20580 28.4691 123.9060 0006308 177.0781 182.9845 14.90525553 15255
GRO
1 21225U 91027B 94074.15950667 .00005538 00000-0 12661-3 0 737
2 21225 28.4604 164.6497 0003468 223.7721 136.2602 15.40375395 42424
UARS
1 21701U 91063B 94076.25976255 .00002830 00000-0 26775-3 0 4872
2 21701 56.9834 167.4368 0004269 96.1849 263.9671 14.96533180137174
/EX
```

408. * SpaceNews 21-Mar-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-03-18 17:40:38 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0321.1994@ampr.org>
Source record: 27662
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0321
* SpaceNews 21-Mar-94 *

BID: $SPC0321

=========
SpaceNews
=========

MONDAY MARCH 21, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* SAREX FACT SHEET - STS-59 *
============================
WHO: Space Shuttle Endeavour crew

WHAT: Talk via Amateur Radio with students on earth.

WHERE: Earth Orbit. 57 degrees inclination. Altitude 220 kilometers.

WHEN: April 7, 1994 (9 day mission)

WHY: As part of the Shuttle Amateur Radio EXperiment (SAREX) component of the STS-59 mission.

LAUNCH: Scheduled for April 7, 1994 at 1207 UTC from the Kennedy Space Center, Cape Canaveral, Florida.

AMATEUR RADIO
LICENSED CREW
MEMBERS: Dr. Jay Apt, N5QWL, Mission Specialist
Dr. Linda Godwin, N5RAX, Payload Commander

PAYLOAD: Primary Payload--Shuttle Radar Laboratory 1 (SRL-1). Apt is the commander of the Blue Shift and will operate the shuttle systems during the "night" shift, while Godwin is responsible for overall operation of three large radars in the shuttle's cargo bay during the "day" shift.

Secondary Payload--Shuttle Amateur Radio EXperiment or SAREX, configuration C.

SPONSORS: The American Radio Relay League (ARRL), The Radio Amateur Satellite Corporation (AMSAT) and The National Aeronautics and Space Administration (NASA). SAREX is supported by the Federal Communications Commission (FCC).

SAREX RADIO
FREQUENCIES:Voice Downlink: (Worldwide) 145.55 MHz [Receive Only]
Voice Uplink: 144.91, 144.93, 144.95, 144.97,
144.99 MHz
Voice Uplink: (Europe only) 144.70, 144.75,
144.80 MHz
Packet Downlink: 145.55 MHz
Packet Uplink: 144.49 MHz

HAM RADIO FM Voice: call signs N5RAX and N5QWL
CALL SIGNS: FM Packet: call sign W5RRR-1

QSL VIA: Send reports and QSLs to ARRL EAD, STS-59 QSL, 225 Main Street, Newington, CT 06111, USA. Include the following information in your QSL or report: STS-59, date, time in UTC, frequency and mode (FM voice or packet). In addition, you must also include an SASE using a large, business-sized envelope if you wish to receive a card. The Orange Park Amateur Radio Club in Florida has generously volunteered to manage the cards for this mission.

INFORMATION:Goddard Amateur Radio Club (Greenbelt, MD) Amateur Radio station (call sign WA3NAN) news and retransmissions on Amateur Radio high frequency (HF) bands at 3.86, 7.185, 14.295, 21.395, and 28.65 megahertz (MHz) and on very high frequency (VHF) bands at 147.45 MHz.

Johnson Space Center Amateur Radio Club (Houston, TX) Amateur Radio station (call sign W5RRR) news bulletins on HF bands at 3.850, 7.227, 14.280, 21.350, and 28.400 MHz and VHF at 146.64 MHz.

ARRL (Newington, CT) Amateur Radio station (call sign W1AW) news bulletins (9:45 PM, 12:45 AM EST) on HF bands at 3.99, 7.29, 14.29, 18.16, 21.39, 28.59 and VHF at 147.555 MHz.

SHUTTLE
TRACKING: Current Keplerian elements to track the Shuttle are available from the NASA Spacelink computer information system BBS (205) 895-0028 and the ARRL BBS (203) 666-0578.

FOR FURTHER
INFORMATION:Tracy Bedlack, N1QDO, Educational Activities Department, American Radio Relay League 203-666-1541 email: ead@arrl.org

SAREX configuration C consists of the handheld transceiver, I/F module, PGSC, spare battery set, window antenna, packet module, SAREX headset assembly, personal recorder, and the required cable assemblies. The packet] module contains a power supply and packet TNC. The power supply provides power for the TNC and the handheld transceiver. The TNC interconnects with a radio transceiver so that data to and from the computer is transmitted to and received from other amateur radio stations.

Configuration C is capable of operating in either the voice or data mode in communications with amateur stations within LOS of the Orbiter. This

configuration can be operated in the attended mode for voice communication
and either the attended or automatic mode for data communications.

The payload control weights are as follows:
Configuration C 45 lb (20.41 kg)

STS-59 Keplerian elements for a 1207 UTC launch:

STS-59
1 00059U 94097.56425350 .00234441 00000-0 12190-3 0 55
2 00059 57.0018 277.1957 0008733 268.0585 91.9530 16.19594525 26

Satellite: STS-59
Catalog number: 00059
Epoch time: 94097.56425350 = (07 APR 94 13:32:31.50 UTC)
Element set: 005
Inclination: 57.0018 deg
RA of node: 277.1957 deg Space Shuttle Flight STS-59
Eccentricity: .0008733 Prelaunch Element set JSC-005
Arg of perigee: 268.0585 deg Launch: 07 APR 94 12:07 UTC
Mean anomaly: 91.9530 deg
Mean motion: 16.19594525 rev/day Gil Carman, WA5NOM
Decay rate: 2.34441e-03 rev/day*2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 307

[Info via the ARRL]

* FO-20 SCHEDULE *
==================
The FO-20 command station announced that FO-20 will be placed in Mode JA
(Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through
26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:
23-Mar-94 07:52 -to- 30-Mar-94 08:15 UTC

Digital mode: Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
===========
Thanks for all the messages of appreciation sent to SpaceNews this week
especially:

IW1QH KZ1Z VK2TFG AD4HJ KD4VGD KD6DSI G8MWF Erik Simonsen
Nihat Tsolak

* FEEDBACK/INPUT WELCOMED *
==========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any

of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

409. Shuttle Reentry Visible I

Newsgroup: rec.radio.amateur.space
Date: 1994-03-19 03:33:00 UTC
From: Jim.Rose@f239.n109.z1.fidonet.org
Message-ID: <249_9403190001@blkcat.fidonet.org>
Source record: 27663

GA>Unfortunately, that would take place at 1421 UTC (6:21 AM PST), about 5
GA>minutes after local sunrise. Gil has seen the reentry before after
GA>sunrise from Houston and says it should still be very visible as an
GA>orange fireball with a white streak behind it.

Gary,
Several years ago I had the opportunity to spot the shuttle as it
re-entered. I was sitting quietly watching NASA Select on the cable and
realized that the ground track and altitude they were showing might just
give me a viewing opportinity. This was in near full daylight. I ran
to the back of the house and figured out the geography, looked in that
direction and sure enough *there it was!*. Just like your friend
described it. As I write this, the shuttle landed this morning so I
hope you got a chance to see it. In the future, don't give up because
of the time of day, it's possible!

Also, thanks for the posts of the Keps/TLEs. I have sent an e-mail via
my internet account at work to subscribe. I hope I got the syntax
correct.

Jim

* OLX 2.1 TD * Backup not found: (A)bort (R)etry (P)anic

410. Re: Frustration over sat tracking prgs...

Newsgroup: rec.radio.amateur.space
Date: 1994-03-19 05:20:21 UTC
From: cbauer@delphi.com
Message-ID: <BwyPQDd.cbauer@delphi.com>
Source record: 27664

track for a number of years and have had
no such problems at all.

Chris

411. Status of Polar-Orbiting Weather Satellites

Newsgroup: rec.radio.amateur.space
Date: 1994-03-19 18:20:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.672.1818.0NC695AF@compart.fi>
Source record: 27665

```
STATUS OF POLAR-ORBITING WEATHER SATELLITES
===========================================
No. 4, March 19, 1994
Station: Helsinki, +60.2N +25.1E

-----------------------------------------------------
NOAA 9 137,62 MHz ON
NOAA 10 137,50 MHz ON
NOAA 11 137,62 MHz ON
NOAA 12 137,50 MHz ON
Meteor 3-3 137,30 MHz OFF
Meteor 3-5 137,85 MHz only daytime, good images!
Meteor 3-6 137,30 MHz OFF
Meteor 2-21 137,85 MHz OFF
-----------------------------------------------------

Here in northern latitudes I have received good visible
channel images from NOAA's till 15.30 UT. Meteor 3-5 has
a very strong signal and good images are available during
daytime.

Leo Wikholm
internet: leo.wikholm@compart.fi
fidonet : 2:220/861
```

412. ARLK011 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-03-19 21:11:04 UTC
From: w1aw-list-approval@world.std.com
Message-ID: <$arlk011.1994@ampr.org>
Source record: 27666
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK011
ARLK011 Keplerian data

ZCZC SK78
QST de W1AW
Keplerian Bulletin 11 ARLK011
From ARRL Headquarters
Newington, CT March 19, 1994
To all radio amateurs

SB KEP ARL ARLK011
ARLK011 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94076.94757505 -.00000120 10000-3 0 2708
2 14129 27.1879 336.6922 6021613 162.9789 232.4425 2.05878186 52931
RS-10/11
1 18129U 87054 A 94075.40199974 0.00000041 28565-4 0 8828
2 18129 82.9231 37.4191 0010266 287.1702 72.8326 13.72333370337187
UO-11
1 14781U 84021 B 94076.08262229 0.00000387 73489-4 0 6745
2 14781 97.7911 95.1034 0010946 200.8625 159.2135 14.69171604536786
RS-12/13
1 21089U 91007 A 94075.53910009 0.00000057 44794-4 0 6720
2 21089 82.9174 80.1605 0030126 9.5405 350.6312 13.74037277155921
AO-13
1 19216U 88051 B 94072.40935734 0.00000166 10000-4 0 8938
2 19216 57.8759 263.4718 7210812 336.8024 2.5676 2.09719189 12500
UO-14
1 20437U 90005 B 94076.76408208 0.00000078 47269-4 0 9740
2 20437 98.5927 162.7732 0011857 97.5347 262.7183 14.29830939216526
AO-16
1 20439U 90005 D 94076.19336562 0.00000065 42387-4 0 7742
2 20439 98.6002 163.3475 0012127 99.9777 260.2776 14.29885704216451
DO-17
1 20440U 90005 E 94076.22662674 0.00000074 45623-4 0 7739
2 20440 98.6015 163.6736 0012240 99.1450 261.1119 14.30024568216474
```

```
WO-18
1 20441U 90005 F 94076.76009072 0.00000050 36422-4 0 7759
2 20441 98.6016 164.2081 0012919 98.9324 261.3326 14.29999789216551
LO-19
1 20442U 90005 G 94076.18464293 0.00000080 47723-4 0 7733
2 20442 98.6015 163.8733 0013183 99.4776 260.7899 14.30094641216486
FO-20
1 20480U 90013 C 94076.44673625 -.00000010 49468-4 0 6690
2 20480 99.0239 245.6518 0540556 187.2385 172.0650 12.83224728192369
AO-21
1 21087U 91006 A 94076.82404168 0.00000093 82657-4 0 4452
2 21087 82.9365 210.2982 0035565 341.4622 18.5235 13.74535946157030
UO-22
1 21575U 91050 B 94075.24420930 0.00000097 47355-4 0 4756
2 21575 98.4400 151.5895 0007108 202.4817 157.6059 14.36899328139730
KO-23
1 22077U 92052 B 94076.18255996 -.00000037 10000-3 0 3704
2 22077 66.0833 112.6185 0011519 310.3641 49.6367 12.86285535 74950
KO-25
1 22830U 93061H 94076.16166154 0.00000077 48244-4 0 2745
2 22830 98.5601 151.1197 0012546 85.4566 274.8057 14.28040646 24568
IO-26
1 22826U 93061 D 94076.69093513 0.00000025 27771-4 0 2718
2 22826 98.6609 153.4175 0010006 113.9173 246.3044 14.27716135 24633
AO-27
1 22825U 93061 C 94076.70330458 0.00000043 35461-4 0 2716
2 22825 98.6608 153.4061 0009542 114.2553 245.9611 14.27613340 24633
PoSat
1 22829U 93061 G 94076.72570023 0.00000089 53672-4 0 2642
2 22829 98.6559 153.4650 0010871 101.9030 258.3374 14.28012006 24644
STS-59
1 99959U 94097.74947238 0.00221188 11303-3 0 76
2 99959 57.0053 276.3038 0009259 269.9963 90.0094 16.19806752 53
Mir
1 16609U 86017 A 94076.52729255 0.00012486 16095-3 0 5324
2 16609 051.6480 285.7565 0014828 039.8907 320.3797 15.58212648461751

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
March 22, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

413. RE: FAQ Available?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 06:36:02 UTC
From: awoodhull@hamp.hampshire.edu
Message-ID: <2mhttu$bao@nic.umass.edu>
Source record: 27667

In Article <9403200930.AA13571@emh.yokota.af.mil>
watersk@emh.yokota.af.MIL (Ken Waters) writes:

>Hello, I would like to find a FAQ on packet satellite communications. Does
>anyone know if such a thing exists? I found a FAQ on packet radio but not
>pacsat. I would like to begin working it but need to know the basics
>including the equipment needed. Thanks.

I just found such a FAQ in 4 parts, posted in the last week or so to
the AX.25 packet network here in the US by KD2BD. As is so often the case
with multi-part posts to the ham BBS network only 2 parts made it to my
local BBS. I wrote to KD2BD and I am hoping he will either post it here or
put it on an ftp site.

73, Al N1AW

Albert S. Woodhull, Hampshire College, Amherst, MA, USA
awoodhull@hamp.hampshire.edu

414. Sat FAQ Answers

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 09:03:46 UTC
From: awoodhull@hamp.hampshire.edu
Message-ID: <2mi6j7$8tj@nic.umass.edu>
Source record: 27668

Sat FAQ Answers

This was downloaded from local BBSs in Massachusetts. The author (or editor) seems to be stephen@mail.boi.hp.com. The article was posted by KD2BD@N2KZH.NJ.USA.NA to SPACE@AMSAT in four parts.

The following text was compiled from the following sources:

* "How to use the EZSATS pas tables by N9LTD" reprinted without permission. Full text, tables, and lots of other useful information can be obtained by sending a SASE to David Mullenix N9LTD, 2052 Brentwood Pky, Madison, WI 53704

* "Amateur Radio Satellite Frequencies" This file can be obtained from the ARRL e-mail server. For information on the server, send an e-mail message to info-serv@arrl.org with 'HELP' in body of message.

* "Summary - Getting onto the Hamsats" This was an article posted to rec.radio.amateur.misc newsgroup by Stephan Greene (sgreene@access.digex.com) on 20 Mar 1992. The article is also available via anon ftp from ftp.cs.buffalo.edu or Australian mirror at grivel.une.edu.au as file pub/hamradio/ham_sat_sum.

* "An Amatuer Satellite Operation Upgrade Path" from the AMSAT Journal, September/October 1993, pp. 24-26.

FORWARD:

Having recently started to get into Satellites, I asked MANY people what it took to get started and what to do. I found few people who could offer all the information necessary to start. I have attempted to compile this information for future newbies. If I have missed something, please ask and I will attempt to add it to the collection.

Also, if you really want to get serious about satellites, I would STRONGLY recommend joining AMSAT to help promote the satellite hobby. AMSAT is a volunteer organization that works for the interests of amateur satellites. Dues are only US $30 per year and you will receive a subscription to "The AMSAT Journal". For US $80, you will receive first year dues and a copy of Instant Track computer tracking software which is a top-notch program. Instant Track was donated to AMSAT by its author and its sales account for a considerable portion of AMSAT's income. AMSAT-NA, 850 Sligo Avenue, Silver Spring, MD 20910-4703. (301) 589-6062. Credit cards welcome.
NOTE: I am in no way connected with AMSAT-NA, other than I have found their publications quite useful.

MODES:

The combination of uplink freq, downlink freq, and transmission mode are all lumped together into standardized satellite MODES. Here is a list of common satellite modes used by satellites covered by this article:

A - This mode requires a 2 meter SSB/CW trasmitter and a 10 meter SSB/CW receiver and supports CW and voice.

B - This mode requires a 70 cm SSB/CW transmitter and a 2 meter SSB/CW receiver and supports CW and voice. Some satellites also support RTTY and SSTV in this mode.

K - This mode requires a 15 meter SSB/CW tra
nsmitter and a 10 meter SSB/CW
receiver and supports CW and voice. This mode is unique in that it can be done with a simple HF rig.

JA- This mode stands for J Analog and requires a 2 meter SSB/CW transmitter and a 70 cm SSB/CW receiver and supports CW, voice.

JD- This mode stands for J Digital and requires a 2 meter FM transmitter and and a 70 cm SSB/CW receiver and supports packet.

S - This mode requires a 70 cm SSB/CW transmitter and a 2.4 GHz SSB/CW receiver and supports CW and voice. Many people use a 2.4 GHz to 2 meter converter with a 2 meter SSB/CW receiver instead of buying a 2.4 GHz SSB/CW receiver.

Also, satellites have 3 basic types of retransmissions: beacon, transponder, and repeater.

Beacon - Most satellites have a fixed Morse beacon at the lower end of the satellites band-pass transponder. This is useful to detect when the satellite has crossed the horizon and is in range for operation. It can also be used to determine dopler shifts.

Transponder - A transponder is a band-pass repeater. It accepts a range of frequencies on the input and retransmits the entire range on the output. All offsets withing that range are preserved. NOTE: since the satellite is transmitting many signals at the same time, it is dividing its output power amongst all of these signals. If someone transmits a very powerful signal into the satellite, it will spend most of its power retransmitting that signal and all of the other signals will drop in power. This is NOT a way to earn friends and people who overpower the satellites input are called "alligators" and are not very popular.

Repeater - This closely resembles a land-based repeater. It listens for signals on one frequency and retransmits it on another frequency. All satellite repeaters (and transponders) are full duplex, meaning you can (and should) listen to your signal on the downlink (with headphones) while you are transmitting.

SATELLITES:

Some satellites are easier to work than others. The satellites that follow can be operated fairly easily and are referred to by some as the Easy Sats.

What follows is a breif description of each satellite. A summary list of operating frequencies is included later.

Mir

Mir (promounced "mere" - "Peace" in Russian) is the Russian Space Station. It's been in orbit since 1986. All recent Russian Cosmonauts have been hams and have callsigns with "MIR" in them, such as U2MIR. Mir has 2-meter equipment on board and they operate packet and voice on 145.55 MHz. (This is the same freq as the Space Shuttles.) The cosmonauts also have a digital voice recorder which can repeatedly transmit voice announcements.

The best way to get a QSL card from Mir is to connect to their TNC's mailbox, R0MIR-2, (That's R Zero MIR) leave a message AND GET A MESSAGE NUMBER. You must have the message number to qualify for a QSL. The TNC is often busy because amateurs forget to disconnect before Mir goes under their horizon. . . . . Press return for more, anything else + return to abort . . . .

In a case like this, try connecting to yourself or a friend VIA R0MIR. And if you hear a heavily accented voice calling CQ, by all means say hello!

70 cm and ATV gear is being prepared for future flights!

QSL Address:
Sergei Samburov (RV3DR)
Prospect Kosmonavtov. d.36, kw.96
Kaliningrad City, MOSCOW 141070, RUSSIA.

Sergei can also be reached via packet radio as RV3DR @ RK3KP.#MSK.RUS.EU

A special note on calculating Mir's orbit: Mir is big and it's in a low orbit. This means that there's a lot of atmospheric drag and it has to fire its rockets every month or two to boost itself back up or it would have re-entered and burned up long ago. Unfortunately, whenever this happens, it throws off all pass predictions. When this happens, Mir will arrive LATER than predicted, so if you tune to 145.55 and nothing happens at the predicted time, keep waiting, it may be along in 10-30 minutes.

SEEING MIR: Mir is also the only EZSAT that can bee seen. Mir is very big, about the size of a semi-trailer, and when it comes over just after sunset or just before sunrise, you can often see it go by. This is because Mir will still be in sunlight while you're in the earth's shadow. In these cases, Mir looks like a very bright star gliding acress the sky. It's a beautiful sight and well worth looking for. It's best to use a tracking program set to VISUAL to find visible passes. The best such programs will even draw you a star map and show you Mir's path across it. Don't forget to tune to 145.55 when you see it. Also, don't forget to get on the local repeater and tell people when you spot it so that others can share in the fun.

[Subject : Sat FAQ Answers 2:4]

OSCAR-21, RS-10/11, RS-12/13

These three satellites are all in 600 mile high polar orbits, which carry them over the US six to eight times a day for 10-18 minutes at a time. They all have orbital periods of about 95 minutes and we typically get two sets of three or four passes spaced 95 minutes apart. The two sets of passes are spaced 12 hours apart and their passes come a little earlier each day because their orbits don't take quite exacly 95 minutes.

These satellites all have a coverage circle about 4000 miles in diameter, so when they're about the horizon, you can use them to work hams anywhere in the continental US, Canada, Alaska, Mexico, Central America, South America down to the Equator, the Caribbean, Greenland, Iceland and parts of Scandinavia. Eastern hams can work Europe and the West can work Hawaii.

All of these satellites are in boxes that are bolted to larger Russian satellites and draw their power from the large satellite's solar cells. They are VERY easy to hear and fairly simple to work.

OSCAR-21

My favorite satellite. This is a German/Russian radio that uses a Digital Signal Processor (DSP) chip and it is Flexible with a capital "F"! It was launched in January, 1990 configured as a linear translator which received a band of 70 cm CW and SSB signals and relayed them on 2 meters. The bird was, to put it mildly, under-utilized. Then in 1992 the DSP chip was reprogrammed in orbit into a cross band FM repeater! If you've been wondering if DSP is as powerful as you've heard, now you know! In the past year, it's telemetry has been re-programmed from an obscure format to standard 1200 baud packet. WEFAX pictures (which are uploaded by teh ground controllers) were added in December 1993. (This is the same format used by many weather sats and short wave weather stations.)

OSCAR-21 has an input frequency of 435.016 MHz, but 435.015 works just fine. It's output frequency is 145.987 MHz, but 145.985 or 145.990 will receive it quite well. It has a strong transmitter and a ground plane antenna and most HTs have no trouble picking its signals up when it passes over. Mobiles and base stations with omni antennas will receive it full quieting. You can get into this bird with 20 watts and a six element beam antenna. I mount my beam on a photo tripod next to my car and run coax to my dual band mobile. You have to point the beam accurately, so I take a list of altitude and azimuth bearing generated by simple tracking software out with me and re-point the beam once a minute. In one summer, I worked the east and west coasts, several Canadians, Texas and Guantanamo Bay, Cuba before fall's cold weather drove me indoors.

Some OSCAR-21 tips: you can hardly get a word in edgewise during "prime time" opening passes. Try the late night passes instead, they're much less crowded. OSCAR-21's transmit and receive polarity rotate constantly during a pass. Mount your beam so you can easily rotate it for the best signal. Remember, all these ham sats are full duplex, so you can and should monitor your signal on the downlink. (Use headphones.) Turn the beam for minimum noise. You'll probably have to modify your dual band rig to get it to transmit on 435.015. BE CAREFUL because FM is generally NOT appreciated below 440 MHz. Also, the mod may allow you to transmit out of band, which is

a real no-no.

OSCAR-21 is also known as RS-14, AO-21 and Rudak-2. It's bolted to a satellite called INFORMATOR-1, which is often abbreviated INFORMTR-1. It's NORAD ID number is 21087. Be careful, the rocket booster that launched the satellite is still up there and it's named INFORMTR-1 R/B in some element sets. Your tracking program may find it instead of the satellite if you're not careful.

RS-10/11

This is probably the easiest satellite to work of them all. It has an incredibly sensitive receiver that can pick up the faintest two meter signal and relay it on ten meters. There are documented examples of people having QSOs on RS-10/11 by clicking Morse on HTs with rubber duck antennas! I guarantee you that your HT can put a useable signal into RS-10/11, I've done it myself. WARNING: if you try this, disable the microphone so you don't transmit any FM sidebands and turn your CTCSS (PL) OFF!

RS-10/11 (Radio Sputnik) is for CW and SSB signals, so an all mode 2 meter rig is ideal for transmitting to this bird. The input bandpass is from 145.860 - 145.900 and the output freqs are from 29.360 - 29.400 MHz. There is also a morse beacon at 29.357 MHz.

RS-12/13

A cousin to RS-10/11, RS-12/13 is also a 40 KHz wide linear transponder. However, this bird is unique because its input frequencies are in the fifteen meter band! This is also the only ham sat in the sky that requires more than a code free technician license to work it, because its input band is from 21.210 - 21.250 MHz. This straddles the Advanced and Extra portions of the 15 meter band. Its output freqs are from 29.410 - 29.450 MHz. Because of skip, this satellite can often be heard and worked when it's below the horizon! At least one person has earned DXCC on this satellite! RS-12/13 is bolted to the ?????? ???? satellite and its NORAD ID is 21089.

DOVE

DOVE is a transmit-only hamsat. It has no user accessible receiver. Built in Argentina, DOVE was launched in 1990 as a goodwill satellite. It was originally intended to transmit digitized voice messages that could be picked up by students with simple receivers. Unfortunately, the digital voice hardware and software has been a constant source of problems since launch. Atempts to get DOVE to works properly are proceeding as this is written, so the best bet is to tune your 2-meter rig or scanner to 145.825 MHz and see what the bird is up to currently. Be ready for Morse, standard 1200 baud packet or (with luck) digitized voice messages. The signals are strong enough so that an HT with a rubber duck will hear it when it's overhead, although ground plane antennas will give better coverage when the bird is near the horizon.

ANTENNAS:

For AO-13, the consensus is get to get KLMs, Telex/Hy-Gains, or roll-your own, Nobody liked the Cushcraft satellite antennas - they appear to have problems in wet weather. Bigger is also better, if you have the space. Several people mentioned the KLM 22C and 40CX pair as excellent performers (again - you need the room for those long booms!) KE4ZV stated his pair of KLMs (the big ones!) lets him work AO-13 with 3 to 30 watts (hardline feed and rigorous attention to routing the feedlines and cables properly to maintain the antenna patterns helps, too.). Others mentioned the KLM 14C/18C pair as good performers - but you need more power on the uplink.

Telex/Hy-Gain antennas were recommended by several people as a less expensive alternative to KLMs that work almost as well. There's also M2 (started by an engineer from KLM). While no one who responded uses them, the information I received from a call to their factory in California suggests they are comparable to slightly better than the KLMs in performance, and about the same in cost. Dave, WB6LFC, said homebrewing antennas is also feasible - it takes work, but attention to detail results in top-notch performance for very little money. Finally, Ross, VE6PDQ, reported good results using a pair of Cushcraft 215WBs on receive.

Problems encountered with AO-13 antennas include routing cables and feedlines off the back of the antennas (to preserve antenna patterns), use of fiberglass cross booms, mounting preamps as close to the feedpoint as possible, and long antenna booms drooping. (Gary, KE4ZV, recommends using a rope to brace the boom or stiffening booms and fiberglass masts internally with foam-in-a-can insulation.)

On antenna rotators, it appears the Alliance UD-100 is no longer made, though it should still show up at hamfests. People with long-boom antennas report the Alliance rotator is too weak to move a big array anyway, and recommended Yaesu's elevation-only rotator or their Model 5400 azimuth-elevation unit.

Antennas for the low-altitude satellites appear to be much less critical. J-poles were most frequently mentioned (the design from the AMSAT Journal?), but dipoles, ground-planes, and yagis are also in use. Several people work RS-10 quite well with antennas in the attic. Best results are with steerable antennas, but the high operator workload during a pass (unless the satellite is just grazing your access circle) almost demands computer control of the rotators.

[Subject : Satellite FAQ Answers 3:4]

PREAMPS:

You need a preamp for AO-13. (I can hear the downlink after a fashion on a Ringo fed with cheap coax and a 10 dB preamp in the shack, but it's not communications quality reception!) Only two people mentioned a specific brand name (Advanced Receiver Research and the unit included with the Ten-Tec 2510), so I assume almost any GaAsFET preamp in the 20dB gain class is adequate. THE PREAMP MUST (almost always) BE MOUNTED AT THE ANTENNA (check the discussion in Chapter 9 of the Satellite Experimenter's Handbook and you'll see why!). KE4ZV recommends mounting the preamp AT the antenna

feedpoint, if your elevation rotator can handle the unbalanced load.

While no one mentioned it (maybe it's obvious), if the antenna is used to transmit (say Mode J) as well as receive (on Mode B, for example), the preamp MUST either include RF-sensed switching, or be switched out of the line before you transmit. TRANSMITTING INTO AN UNPROTECTED PREAMP WILL DESTROY IT INSTANTLY!

Preamps also seem to help on RS-10 (especially with older HF rigs) and on the Pacsats. It seems to be a case of "try it, and get a preamp if it looks like it would help").

RIGS:

Three radios were mentioned by name - Yaesu FT736 (and it's predecessor, the 726 with satellite module), Kenwood TR751 (a mobile-capable 2 meter multimode), and Ten-Tec's 2510. The Ten-Tec unit is out of production. The few units left are selling for about $300-350. I'm sure other multi-mode radios, and setups with converters and transverters work well, too - it's just that no one mentioned any by name.

Power output required is a function of the satellite, your antennas, and how badly you want to communicate. [QRP on the satellites is just like QRP on HF - you need good antennas and feedline, you have to pick optimal passes, and skilled operators at both ends are needed. Given the apparent "calmer" operating style on AO-13, QRP is probably easier there than on 20 meters!]

Anyway -about power for AO-13. 3-30 watts will work if you have top-notch antennas (KE4ZV). KC7IT uses 50-100 watts (Ten Tec 2510, Mirage D1010 amplifier, KLM 14C/18C fed with 50 feet of 9913). Both KE4ZV and KC7IT use Mirage D1010 amplifiers on 70 cm when they need a little extra power. For an "optimum station", WA5ZIB recommends 60 watts on 70 cm and 80 watts on 2 meters for AO-13, assuming good antennas (Telex/Hy-Gain or better) and feedlines, and 20 watts to a 5' dish for Mode L. Andy emphasized that you can get by and have lots of fun with much less!

For Mode A, WA5ZIB said 6 watts to the AO-13 2 meter antenna will work well. People using omnis report success with the Pacsats running 50-70 watts to a J-Pole (N5VGC). Several people said they (or someone they know) have no trouble using RS-10 at lower power (10-25 watts) with simple, omnidirectional antennas. Again, it's a case of "try it and see if it works."

There was unanimous consensus that the receiving equipment (antenna, preamp, feedline, and receiver) is more important than the transmit equipment. Running more power "to hear yourself" is frowned upon, to say the least! It's also important to be able to vary uplink power to adjust to specific conditions. Both the Ten Tec 2510 and the Yaesu 736 have continuously variable power output (I guess the rest of us just have to fiddle with the drive controls on our rigs!).

ACCESSORIES AND OTHER STUFF:

You need a PSK modem to use the Pacsats. PacCom makes fully assembled units, either already integrated with their own TNC, or as a board you install in your TNC-2 clone. They make similar 9600 bps units for accessing UO-22. The downlink receiver (on 70 cm) should be capable of being tuned by the PSK modem's AFC lines. Newer radios can use the up/down lines from the microphone jack or an accessory connection on the rear panel. Older radios must be modified, or be tuned manually. N5VGC told me he sees about 20KHz of doppler on an AO-16 pass, and that without automatic tuning, operator workload is too high to do much else besides tune the receiver!

Just about any radio suitable for packet on 2 meters will work for AO-16, WO18, and LU-19. To run 9600 bps on UO-22, modifications to bypass the microphone and speaker's audio processing circuits are required. I've seen some reports on rec.radio.packet and in the various Hamsat columns that differences between UO14 and UO-22's transmitters make UO-22 more difficult to copy. (I'll worry about that problem later - I'll start with AO-16 and LU-19 first!)

No one mentioned computers - again, it must be obvious (also, we're "talking" using computers!). They're handy, and you need one IN THE SHACK when working the Pacsats or for automated, real-time control of antenna rotators (useful for low altitude satellites).

Other operator aids mentioned, or I thought of on my own: If your radio can't slave uplink and downlink tuning (Ten Tec 2510 and Yaesu 736 can), you need something to help convert between uplink and downlink frequencies (and account for doppler shift and calibration errors on the radios' frequency readouts). A cardboard slide scale or dial will work. I'm thinking of programming my HP48 to do the conversion for me. You need something like this to know where to tune on the uplink to hear a given downlink frequency.

Software to track satellites and predict passes. There are many programs that work. Price ranges from free to $70 for state-of-the-art QuickTrack or InstantTrack (available from AMSAT). Special software is also needed to use the Pacsats, and to interpret telemetry data. This software is also available from the usual ham sources, and from AMSAT (BTW, software sales support the amateur satellite program!)

Polarity switchers optimize antenna performance by allowing switching antenna feeds from RHCP to LHCP as the need arises. They are a very useful add-on, but don't appear essential.

Equipment to measure power output, SWR, transmit frequency - all useful (see - satellites are not that different from HF!).

[Subject : Sat FAQ Answers 4:4]

FREQUENCIES:

Amateur Radio Satellite Frequencies (as of January 1994)
[A
Designation Freqs Transponder Mode
Beacon

AO-10
Downlinks 145.810 B B
145.825-.975 T B
145.987 B B (Usually off)
Uplinks 435.027-.179 T B

RS-10
Downlinks 29.357 B A
29.360-.400 T A
29.403 B Robot A
145.857 B T/KT
145.903 B Robot T/KT
Uplinks 145.860-.900 T T/KT

RS-12
Downlinks 29.408 B K
29.410-.450 T K
29.454 B Robot K
145.913 B T/KT
145.959 B Robot T/KT
Uplinks 21.210-.250 T K

AO-13
Downlinks 145.812 B B
145.825-.975 T B
145.985 B B (Usually off)
435.651 B L/JL
435.677 RUDAK
435.715-6.005 T L/JL
2400.664 B S
2400.711-.749 T S
Uplinks 435.423-.573 T B/S
435.601-.637 T B/S

AO-16
Downlinks 437.02625 T/B J Dig. (1200b SSB) (secondary)
437.05130 T/B J Dig. (1200b Rai. Cos SSB) (pri)
2401.14280 B 1200 bps SSB (Usually off)
Uplinks 145.900 T 1200 bps AFSK FM Digital
145.920 T 1200 bps AFSK FM Digital
145.940 T 1200 bps AFSK FM Digital
145.960 T 1200 bps AFSK FM Digital

DO-17
Downlinks 145.82438 B 1200 bps AFSK FM or Dig Voice
145.82516 B 1200 bps AFSK FM or Dig Voice
2401.22050 B 1200 bps BPSK (SSB) (usually off)
Uplinks None

WO-18
Downlink 437.10200 B 1200 bps BPSK, J Dig (Telem, Image)
Uplink None

LO-19
Downlinks 437.125 T/B J Digital (secondary)
437.127 B CW
437.154 T/B J Digital (primary)
Uplinks 145.840 T 1200 bps AFSK FM Digital
145.860 T 1200 bps AFSK FM Digital
145.880 T 1200 bps AFSK FM Digital
145.900 T 1200 bps AFSK FM Digital

FO-20
Downlinks 435.795 B J Analog
435.800-.900 T J Analog (See below)
435.910 T/B 1200 bps BPSK (SSB), J Digital
Uplinks 145.850 T 1200 bps AFSK FM Digital
145.870 T 1200 bps AFSK FM Digital
145.890 T 1200 bps AFSK FM Digital
145.910 T 1200 bps AFSK FM Digital
OR 145.900-6.00 T CW/SSB (Alternates with above every
other week. Changes on Wednesdays)

AO-21
Downlinks 145.852-.932 T CW/SSB
145.866-.946 T CW/SSB
145.985 Repeater FM (Alternates with voice
bulletins and telemetry)
Uplinks 435.022-.102 T CW/SSB
435.601-.637 T CW/SSB
435.015 Repeater FM (See above)

UO-22
Downlink 435.120 T 9600 bps FM Digital
Uplinks 145.900 T 9600 bps FM Digital
145.975 T 9600 bps FM Digital

KO-23 (KITSAT)
Downlink 435.175 T 9600 bps FM Digital
Uplinks 145.850 T 9600 bps FM Digital
145.900 T 9600 bps FM Digital

Mir
Downlink 145.55 T/Robot (Packet mailbox. Alternates
with simplex FM voice QSOs occasionally)

KO-25 (KITSAT-B)
Downlink 435.175/436.500 MHz 9600 bps FSK FM Digital
Uplink 145.870/145.980 MHz 9600 bps FSK FM Digital

AO-26 (ITAMSAT)
Downlink 435.867 MHz 1200 bps PSK Digital
Uplinks 145.875 MHz 1200 bps FM Digital
145.900 MHz 1200 bps FM Digital
145.925 MHz 1200 bps FM Digital
145.950 MHz 1200 bps FM Digital

AMRAD (not yet active)
Downlink 436.900 MHz 9600 bps FSK FM
Uplink 145.850 MHz 9600 bps FSK FM

PO-28
Uplink 145.975 MHz JD 9600 bps FSK (Primary)
145.925 MHZ JD 9600 bps FSK (Secondary)
Downlink 435.075 MHz JD 9600 bps FSK (Primary)
435.050 MHz JD 9600 bps FSK (Secondary)
Note: PoSat will be available to all radio amateurs from January 28, 1994.

stephen@mail.boi.hp.com.

(original header for part 1
From : KD2BD @ N2KZH.NJ.USA.NA
To : SPACE @ AMSAT
Date : 940310/1641
Msgid : BN 20159@N2KZH, 59859@W1NY $SATFAQ1
Subject : Sat FAQ Answers 1:4)

415. RE: FAQ Available?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 09:13:35 UTC
From: awoodhull@hamp.hampshire.edu
Message-ID: <2mi75b$8tj@nic.umass.edu>
Source record: 27669

In Article <2mhttu$bao@nic.umass.edu> I wrote:

>I just found such a FAQ in 4 parts, posted in the last week or so to
>the AX.25 packet network here in the US by KD2BD. As is so often the case
>with multi-part posts to the ham BBS network only 2 parts made it to my
>local BBS.

I was able to find the missing parts on another BBS and I have posted it to
this group as Sat FAQ Answers, the title under which it was posted to the
BBS network.

I presume that further posting is OK with the original authors. What I
posted seems to be a composite of several different articles and it isn't
clear who wrote what or who edited the composite document.

73, Al N1AW

Albert S. Woodhull, Hampshire College, Amherst, MA, USA
awoodhull@hamp.hampshire.edu

416. FAQ Available?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 09:30:08 UTC
From: watersk@emh.yokota.af.MIL
Message-ID: <9403200930.AA13571@emh.yokota.af.mil>
Source record: 27670

Hello, I would like to find a FAQ on packet satellite communications. Does anyone know if such a thing exists? I found a FAQ on packet radio but not pacsat. I would like to begin working it but need to know the basics including the equipment needed. Thanks.
Ken/N4PBY

Ken Waters, Fussa-shi, Tokyo-to, Japan
watersk@emh.yokota.af.mil
73307.131@compuserve.com
k.waters@genie.geis.com
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417. 2-Line Orbital Elements WEA-9403.19.1994

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 13:23:42 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.8X1HJc1w165w@asarin.org.ar>
Source record: 27671

```
SB KEPS @ AMSAT $WEA-9403.19.1994
2-Line Orbital Elements WEA-9403.19
HR LU7AKC ORBITAL ELEMENTS FOR WEATHER SATELLITES
BID: $WEA-9403.19

DECODE THE 2-LINE ELEMENT SETS WITH
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

DMSP B5B-04
1 05557U 71087 A 94046.08810487 0.00000101 64466-4 0 5676
2 05557 99.1302 271.2998 0054691 41.4940 319.0370 14.23237080157605
DMSP B5C-06
1 06275U 72089 A 94043.58145448 0.00000113 69459-4 0 6656
2 06275 98.6254 259.9974 0037230 261.6379 98.0581 14.22810055101034
DMSP B5D1-3
1 10820U 78042 A 94046.03932775 0.00000177 87583-4 0 3646
2 10820 98.6551 237.5422 0009797 10.8342 349.3042 14.28777806821413
DMSP B5D2-1
1 13736U 82118 A 94047.02963511 0.00000091 38806-4 0 3498
2 13736 098.6319 238.7353 0008727 354.9829 005.1796 14.25611469579540
DMSP B5D2-2
1 14506U 83113 A 94043.48306532 0.00000124 72424-4 0 8665
2 14506 98.3695 219.2545 0011903 179.0920 181.0280 14.23714656531376
DMSP B5D2-3
1 18123U 87053 A 94048.04427424 -.00000196 00000-0 0 3125
2 18123 098.7855 241.5003 0014058 162.1766 198.0438 14.15334286344013
DMSP B5D2-4
1 18822U 88006 A 94048.03168228 -.00000006 00000-0 0 4168
2 18822 098.4546 267.8701 0006544 339.4454 020.6971 14.22927426313439
DMSP B5D2-5
1 20978U 90105 A 94048.08845942 0.00000231 82900-4 0 5169
2 20978 098.6983 111.3429 0079724 157.6860 202.8333 14.32373273167914
DMSP B5D2-6
1 21798U 91082 A 94048.06239186 0.00000160 85084-4 0 1758
2 21798 098.9625 053.6274 0013310 119.4953 240.8130 14.13765141114642
GOES 2 R
1 10062U 77048 B 94044.91764046 0.00000181 25789-4 0 3676
2 10062 28.4191 2.3423 0761928 193.3964 164.5242 13.30796042807866
GOES 3 R
1 07735U 75027 B 94047.96577140 0.00000127 57362-4 0 3682
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2 07735 114.9817 056.7234 0040715 192.4938 167.5052 14.21823840977478
GOES 6 R
1 14051U 83041 B 94045.17695222 0.00001914 20866-3 0 4885
2 14051 25.3429 352.7455 1352659 163.1101 201.9315 12.50792293485270
OKEAN 1
1 19274U 88056 A 94047.89924351 0.00000169 21204-4 0 8644
2 19274 082.5168 348.1892 0020890 047.4068 312.9544 14.82089035303260
OKEAN 1 R
1 19275U 88056 B 94045.85612777 0.00000252 32030-4 0 2629
2 19275 82.5170 358.4007 0023949 81.6804 278.7120 14.77324394302422
OKEAN 2
1 20510U 90018 A 94047.76877289 0.00000274 37783-4 0 2654
2 20510 082.5244 296.6799 0018240 222.0501 137.9960 14.78256509213873
OKEAN 2 R
1 20511U 90018 B 94040.18173672 0.00000159 20334-4 0 8639
2 20511 82.5266 307.6777 0017361 265.5410 94.3826 14.75088343212491
OKEAN 3
1 21397U 91039 A 94047.97346102 0.00000583 84183-4 0 9667
2 21397 082.5233 208.0021 0022170 292.7507 067.1947 14.76123763145772
OKEAN 3 D
1 21842U 91039 C 94045.84090004 0.00001263 16230-3 0 5651
2 21842 82.5239 206.1257 0020227 288.0675 71.8331 14.80306886145726
OKEAN 3 R
1 21398U 91039 B 94046.46287310 0.00000188 24614-4 0 6656
2 21398 82.5238 210.6962 0022507 306.4452 53.4677 14.74895009145479
TIROS 2
1 00063U 600PI1 94043.56348375 0.00000778 88819-4 0 4621
2 00063 48.5252 224.5938 0045749 248.3930 111.2115 14.96402064790822
TIROS 10 D
1 01440U 65051C 94044.63529445 0.00030785 48911-3 0 5292
2 01440 98.5290 290.2793 0023036 122.5668 237.7879 15.52987427536715
TIROS N
1 11060U 78096 A 94044.70090970 0.00000031 37948-4 0 8651
2 11060 98.6771 101.9352 0010101 261.4638 98.5392 14.15589441 5768
NOAA-9
1 15427U 84123A 94074.03402688 .00000126 00000-0 90853-4 0 7505
2 15427 99.0656 123.3704 0015705 122.8642 237.4045 14.13597974477046
NOAA-10
1 16969U 86073A 94073.99072129 .00000108 00000-0 64636-4 0 6475
2 16969 98.5121 85.8616 0012156 244.1267 115.8662 14.24872785389191
MET-2/17
1 18820U 88005A 94076.18240290 .00000127 00000-0 99308-4 0 2729
2 18820 82.5456 341.7797 0018514 79.0102 281.3131 13.84711418309624
MET-3/2
1 19336U 88064A 94072.89393314 .00000051 00000-0 10000-3 0 2689
2 19336 82.5411 31.1102 0017651 137.2192 223.0298 13.16965600270718
NOAA-11
1 19531U 88089A 94073.96248747 .00000086 00000-0 71361-4 0 5590
2 19531 99.1660 60.5963 0012728 40.9981 319.2144 14.12967309281919
MET-2/18
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1 19851U 89018A 94075.85339731 .00000027 00000-0 10933-4 0 2716
2 19851 82.5182 217.5195 0015409 122.8587 237.3935 13.84358686254919
MET-3/3
1 20305U 89086A 94075.88142870 .00000044 00000-0 10000-3 0 43
2 20305 82.5576 333.8085 0006499 152.2875 207.8581 13.04425109210860
MET-2/19
1 20670U 90057A 94075.63449506 .00000024 00000-0 79036-5 0 7734
2 20670 82.5434 281.9855 0017468 47.7992 312.4642 13.84190213187814
FY-1/2
1 20788U 90081A 94076.22426307 -.00000172 00000-0 -85968-4 0 9199
2 20788 98.8393 99.2948 0013308 265.4548 94.5096 14.01312219180823
MET-2/20
1 20826U 90086A 94071.91097536 .00000059 00000-0 40218-4 0 7814
2 20826 82.5228 222.5667 0012920 323.8660 36.1626 13.83574515174445
MET-3/4
1 21232U 91030A 94071.87651682 .00000051 00000-0 10000-3 0 6792
2 21232 82.5362 237.6665 0014715 65.8899 294.3776 13.16460820138681
NOAA-12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
MET-3/5
1 21655U 91056A 94076.19735930 .00000051 00000-0 10000-3 0 6877
2 21655 82.5556 181.6999 0014730 67.7742 292.4937 13.16828055124353
MET-2/21
1 22782U 93055A 94072.07378319 .00000044 00000-0 26732-4 0 2819
2 22782 82.5479 282.6058 0022877 131.3043 229.0093 13.83002641 26809
/EX
```

418. 2-Line Orbital Elements WEA-9403.19.1994

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 13:23:44 UTC
From: lu7akc@asarin.org.ar
Message-ID: <$wea-9403.19.1994@ampr.org>
Source record: 27672
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $WEA-9403.19.1994
2-Line Orbital Elements WEA-9403.19
HR LU7AKC ORBITAL ELEMENTS FOR WEATHER SATELLITES
BID: $WEA-9403.19

DECODE THE 2-LINE ELEMENT SETS WITH
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

DMSP B5B-04
1 05557U 71087 A 94046.08810487 0.00000101 64466-4 0 5676
2 05557 99.1302 271.2998 0054691 41.4940 319.0370 14.23237080157605
DMSP B5C-06
1 06275U 72089 A 94043.58145448 0.00000113 69459-4 0 6656
2 06275 98.6254 259.9974 0037230 261.6379 98.0581 14.22810055101034
DMSP B5D1-3
1 10820U 78042 A 94046.03932775 0.00000177 87583-4 0 3646
2 10820 98.6551 237.5422 0009797 10.8342 349.3042 14.28777806821413
DMSP B5D2-1
1 13736U 82118 A 94047.02963511 0.00000091 38806-4 0 3498
2 13736 098.6319 238.7353 0008727 354.9829 005.1796 14.25611469579540
DMSP B5D2-2
1 14506U 83113 A 94043.48306532 0.00000124 72424-4 0 8665
2 14506 98.3695 219.2545 0011903 179.0920 181.0280 14.23714656531376
DMSP B5D2-3
1 18123U 87053 A 94048.04427424 -.00000196 00000-0 0 3125
2 18123 098.7855 241.5003 0014058 162.1766 198.0438 14.15334286344013
DMSP B5D2-4
1 18822U 88006 A 94048.03168228 -.00000006 00000-0 0 4168
2 18822 098.4546 267.8701 0006544 339.4454 020.6971 14.22927426313439
DMSP B5D2-5
1 20978U 90105 A 94048.08845942 0.00000231 82900-4 0 5169
2 20978 098.6983 111.3429 0079724 157.6860 202.8333 14.32373273167914
DMSP B5D2-6
1 21798U 91082 A 94048.06239186 0.00000160 85084-4 0 1758
2 21798 098.9625 053.6274 0013310 119.4953 240.8130 14.13765141114642
GOES 2 R
1 10062U 77048 B 94044.91764046 0.00000181 25789-4 0 3676
2 10062 28.4191 2.3423 0761928 193.3964 164.5242 13.30796042807866
GOES 3 R
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1 07735U 75027 B 94047.96577140 0.00000127 57362-4 0 3682
2 07735 114.9817 056.7234 0040715 192.4938 167.5052 14.21823840977478
GOES 6 R
1 14051U 83041 B 94045.17695222 0.00001914 20866-3 0 4885
2 14051 25.3429 352.7455 1352659 163.1101 201.9315 12.50792293485270
OKEAN 1
1 19274U 88056 A 94047.89924351 0.00000169 21204-4 0 8644
2 19274 082.5168 348.1892 0020890 047.4068 312.9544 14.82089035303260
OKEAN 1 R
1 19275U 88056 B 94045.85612777 0.00000252 32030-4 0 2629
2 19275 82.5170 358.4007 0023949 81.6804 278.7120 14.77324394302422
OKEAN 2
1 20510U 90018 A 94047.76877289 0.00000274 37783-4 0 2654
2 20510 082.5244 296.6799 0018240 222.0501 137.9960 14.78256509213873
OKEAN 2 R
1 20511U 90018 B 94040.18173672 0.00000159 20334-4 0 8639
2 20511 82.5266 307.6777 0017361 265.5410 94.3826 14.75088343212491
OKEAN 3
1 21397U 91039 A 94047.97346102 0.00000583 84183-4 0 9667
2 21397 082.5233 208.0021 0022170 292.7507 067.1947 14.76123763145772
OKEAN 3 D
1 21842U 91039 C 94045.84090004 0.00001263 16230-3 0 5651
2 21842 82.5239 206.1257 0020227 288.0675 71.8331 14.80306886145726
OKEAN 3 R
1 21398U 91039 B 94046.46287310 0.00000188 24614-4 0 6656
2 21398 82.5238 210.6962 0022507 306.4452 53.4677 14.74895009145479
TIROS 2
1 00063U 600PI1 94043.56348375 0.00000778 88819-4 0 4621
2 00063 48.5252 224.5938 0045749 248.3930 111.2115 14.96402064790822
TIROS 10 D
1 01440U 65051C 94044.63529445 0.00030785 48911-3 0 5292
2 01440 98.5290 290.2793 0023036 122.5668 237.7879 15.52987427536715
TIROS N
1 11060U 78096 A 94044.70090970 0.00000031 37948-4 0 8651
2 11060 98.6771 101.9352 0010101 261.4638 98.5392 14.15589441 5768
NOAA-9
1 15427U 84123A 94074.03402688 .00000126 00000-0 90853-4 0 7505
2 15427 99.0656 123.3704 0015705 122.8642 237.4045 14.13597974477046
NOAA-10
1 16969U 86073A 94073.99072129 .00000108 00000-0 64636-4 0 6475
2 16969 98.5121 85.8616 0012156 244.1267 115.8662 14.24872785389191
MET-2/17
1 18820U 88005A 94076.18240290 .00000127 00000-0 99308-4 0 2729
2 18820 82.5456 341.7797 0018514 79.0102 281.3131 13.84711418309624
MET-3/2
1 19336U 88064A 94072.89393314 .00000051 00000-0 10000-3 0 2689
2 19336 82.5411 31.1102 0017651 137.2192 223.0298 13.16965600270718
NOAA-11
1 19531U 88089A 94073.96248747 .00000086 00000-0 71361-4 0 5590
2 19531 99.1660 60.5963 0012728 40.9981 319.2144 14.12967309281919
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MET-2/18
1 19851U 89018A 94075.85339731 .00000027 00000-0 10933-4 0 2716
2 19851 82.5182 217.5195 0015409 122.8587 237.3935 13.84358686254919
MET-3/3
1 20305U 89086A 94075.88142870 .00000044 00000-0 10000-3 0 43
2 20305 82.5576 333.8085 0006499 152.2875 207.8581 13.04425109210860
MET-2/19
1 20670U 90057A 94075.63449506 .00000024 00000-0 79036-5 0 7734
2 20670 82.5434 281.9855 0017468 47.7992 312.4642 13.84190213187814
FY-1/2
1 20788U 90081A 94076.22426307 -.00000172 00000-0 -85968-4 0 9199
2 20788 98.8393 99.2948 0013308 265.4548 94.5096 14.01312219180823
MET-2/20
1 20826U 90086A 94071.91097536 .00000059 00000-0 40218-4 0 7814
2 20826 82.5228 222.5667 0012920 323.8660 36.1626 13.83574515174445
MET-3/4
1 21232U 91030A 94071.87651682 .00000051 00000-0 10000-3 0 6792
2 21232 82.5362 237.6665 0014715 65.8899 294.3776 13.16460820138681
NOAA-12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
MET-3/5
1 21655U 91056A 94076.19735930 .00000051 00000-0 10000-3 0 6877
2 21655 82.5556 181.6999 0014730 67.7742 292.4937 13.16828055124353
MET-2/21
1 22782U 93055A 94072.07378319 .00000044 00000-0 26732-4 0 2819
2 22782 82.5479 282.6058 0022877 131.3043 229.0093 13.83002641 26809
/EX
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419. Re: FAQ Available?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 15:47:58 UTC
From: pschleck@cwis.unomaha.edu
Message-ID: <pschleck.764178478@cwis>
Source record: 27677

In <9403200930.AA13571@emh.yokota.af.mil> watersk@emh.yokota.af.MIL (Ken Waters) writes:

>Hello, I would like to find a FAQ on packet satellite communications. Does
>anyone know if such a thing exists? I found a FAQ on packet radio but not
>pacsat. I would like to begin working it but need to know the basics
>including the equipment needed. Thanks.
>Ken/N4PBY

On or about Feb 28th, Stephen Holmstead (stephen@hpdmlge.boi.hp.com) posted
a fairly comprehensive amateur radio in space FAQ. I wrote him a while
back and made some suggestions, particularly in regard to making it
available via several FTP archives that would be glad to have it, but
haven't heard anything from him since.

Perhaps if you dropped him a line, and asked nicely, he would send you a
copy.

--
73, Paul W. Schleck, KD3FU
pschleck@unomaha.edu

420. ANS-078 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 16:44:24 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-078.01.1994@ampr.org>
Source record: 27673
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-078.01
PHASE-3D STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 078.01 FROM AMSAT HQ
SILVER SPRING, MD MARCH 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-078.01

AMSAT PHASE 3-D INTERNATIONAL SATELLITE BUILDERS MEET IN
MARBURG--PROPELLANT TANKS DELIVERED

During the week of February 10-16, 1994, Dr. Karl Meinzer, DJ4ZC, AMSAT-DL President and Project Leader for the International AMSAT Phase-3D satellite, and Werner Haas, DJ5KQ, Vice-President of AMSAT-DL hosted a working meeting in Marburg, Germany to discuss recent progress on the project. Agenda items centered primarily around the spacecraft's electronic systems including the on-board computer (IHU) and RUDAK systems, as well as the progress now being made by team members on the spacecraft's other electronic modules.

Also during the meeting, the team took delivery of P3-D's main propellant tanks. The tanks were manufactured in Russia under contract from AMSAT-DL and in accordance with AMSAT specifications. Seven tanks were delivered, although one had been subjected to a destructive pressure test by its Russian manufacturer.

Not only have all the propellant tank specifications been fully achieved, but they've actually been significantly surpassed. Each tank can accommodate almost 50 liters of propellant. Favorable conditions for the purchase and delivery of these tanks was arranged through the efforts of AMSAT-UA (Russia). Following a brief inspection, the tanks were immediately shipped to Orlando, Florida, where integration of the satellite is now slated to begin this summer.

Dick Jansson, WD4FAB, AMSAT-NA Vice-President for Engineering, also attended the meeting, principally to discuss various aspects of the satellite's structure with Dr. Meinzer and Konrad Mueller, DG7FDQ. He reported on the good progress of the flight model structure's construc-tion, currently underway at Weber State University in Utah.

Also in attendance were Lyle Johnson, WA7GXD, Peter Guelzow, DB2OS, and Gerhard Metz, DG2CV. Lyle is known through his work with the Tucson Amateur Packet Radio (TAPR) group (which he co-founded) as well as for his work on the Microsats and on the P3-D GPS project. After much discussion, the team decided to again employ a cable wiring harness

arrangement for Phase 3-D, similar to that used on AO-10 and AO-13, rather than an AART-based LAN design. However, the team decided to also fly a CAN bus and DB2OS's experimental LAN controller as part of the spacecraft's digital (RUDAK) transponder.

In a related decision, the group concluded that the AO-10/AO-13 1802-based Internal Housekeeping Unit (IHU) computer design would still be adequate for P3-D with some minor modifications. Lyle Johnson announced his willingness to redesign the IHU and to construct a flight unit. His offer was greatfully accepted.

Other meeting items centered on P3-D's RUDAK work now being done by Peter Guelzow, Gerhard Metz, and Dr. Stefan Eckart, DL2MDL. This team has now decided to build two RUDAKs. The first will be a user-oriented digital communications module constructed by Lyle Johnson, in close cooperation with Peter Guelzow. This RUDAK, which has yet to be formally named, will be the one most P3-D satellite users will operate. A second, more experimental RUDAK (called RUDAK-E), will be built in Germany. It will promote experiments with advanced high speed modems, Digital Signal Processing (DSP) techniques, and new communications protocols.

In a host of other issues, Daniel Orban, ON4AOD, discussed details of the 24 GHz transmitter. Konrad Hupfer, DJ1EE, reported his progress in building the 250 watt U-Band (70 cm) final amplifier. Werner Haas displayed his first flight hardware consisting of two command receivers, a digital section, and the 70 cm exciter that will drive Konrad's 70 cm final amplifier. Freddy de Guchteneirie, ON6UG, reported his progress on the construction of dual V-Band and U-Band receiver "front-ends". Dr. Matjaz Vidmar, S51MV, reported he has now begun construction of the HF-Band, C-Band and S-Band receivers. He expects to deliver working prototypes in May.

While much work still remains to be done, Dr. Meinzer expressed his approval and sincere thanks to all participants for their superb work and close cooperation on this vitally important AMSAT international project. A complete text of this meeting's minutes has been prepared by Peter Guelzow, and has since been translated by Don Moe, DJ0HC/KE6MN. The text will be made available to the various international AMSAT Journals for possible inclusion in their upcoming editions.

[The AMSAT News Service (ANS) would like to thank Peter Guelzow, DB2OS, Don Moe, DJ0HC/KE6MN, Lyle Johnson, WA7GXD, and Keith Baker, KB1SF, for their assistance in writing, translating, and formatting the information contained in this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-078.02
ITAMSAT-OSCAR-26 PROBLEM

HR AMSAT NEWS SERVICE BULLETIN 078.02 FROM AMSAT HQ
SILVER SPRING, MD MARCH 19, 1994
TO ALL RADIO AMATEURS BT

BID: $ANS-078.02

ITAMSAT-OSCAR-26 (IO-26) Ground Team Discovers Problem

Starting last week the PSK modulation on the primary trasmitter became more and more difficult to decode. A residual carrier and lower output power seem to indicate a failure in the PSK balanced modulator, being worse at the current low power setting. Increasing the power level makes the de-modulation better but is not accetable due to power budget constraints. Ground controllers decided to switch to the secondary PSK trasmitter on 435.822 MHz. The first two passes over Italy confirmed the correct operation of the spacecraft and WOD are being taken to analize the per-formance of the satellite in this new configuration. BBS is working as usual and status bulletin will be uploaded in the next few days.

73 de ITAMSAT (IO-26) Command Team

/EX
SB SAT @ AMSAT $ANS-078.03
AO-13 OPERATIONS NET SCHEDS

HR AMSAT NEWS SERVICE BULLETIN 078.03 FROM AMSAT HQ
SILVER SPRING, MD MARCH 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-078.03

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

26-Mar-94 2130 B 084 WA5ZIB W5IU

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

AO-13 ZRO Tests For March 1994

The following schedule of Mode "B" tests were chosen for convenient operating times and favorable squint angles. The tests can be heard on 145.840 MHz. Andy McAlister (WA5ZIB) will conduct all the tests. Mode "JL" tests will no longer occur due to the failure of AO-13's 70CM trans-mitter.

Day Date (UTC) Time Areas covered

Saturday Mar. 26, 1994 2315 UTC NA, SA

Note that the dates and days are shown in "UTC". Any changes will be announced as soon as possible via the AMSAT HF and AO-13 Operations Nets.

All listener reports with date of test and numbers copied should be sent to Andy McAllister (WA5ZIB), AMSAT V.P. User Operations, 14714 Knights Way Drive, Houston, TX 77083-5640. A report will be returned verifying the level of accurate reception. An S.A.S.E. is appreciated but not required.

SSTV ON OSCAR 13

Slow scanners are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-078.04
SAREX STS-59 CORRECTION

HR AMSAT NEWS SERVICE BULLETIN 078.04 FROM AMSAT HQ
SILVER SPRING, MD MARCH 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-078.04

Correction To NASA Landline BBS Phone Number

Last week's AMSAT News Service (ANS) ANS-071.02 bulletin referred to the NASA Info Board BBS at Johnson Space Center as a source of information for Keplerian elements and SAREX bulletins. This bulletin board system was operated and maintained by the Public Affairs Office of the Johnson Space Center and is now no longer operational.

Johnson Space Center Amateur Radio Club is currently seeking a way to get a small BBS up and running prior to the flight. As soon as a system is established, an announcement will be issued to promulgate and distribute the telephone number.

73,
Dale Martin, KG5U @ KA5KTH.#setx.tx.usa.na
Sec'y, Johnson Space Center ARC
Houston, Texas

/EX
SB SAT @ AMSAT $ANS-078.05
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 078.05 FROM AMSAT HQ
SILVER SPRING, MD MARCH 19, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-078.05

Weekly OSCAR Status Reports: 19-MAR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Mar 19-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Alon/Alat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 235/0, Apr 04 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:

23-MAR-94 7:52 -TO- 30-MAR-94 8:15 UTC

DIGITAL MODE: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-16: Operating normally. [WH6I]

LO-19: Operating normally. [WH6I]

IO-26: Operating normally. [WH6I]

KO-23: Operating normally. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

421. Re: FAQ Available?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 22:37:04 UTC
From: pschleck@cwis.unomaha.edu
Message-ID: <pschleck.764203024@cwis>
Source record: 27674

In <2mi75b$8tj@nic.umass.edu> awoodhull@hamp.hampshire.edu writes:

>In Article <2mhttu$bao@nic.umass.edu> I wrote:

>>I just found such a FAQ in 4 parts, posted in the last week or so to
>>the AX.25 packet network here in the US by KD2BD. As is so often the case
>>with multi-part posts to the ham BBS network only 2 parts made it to my
>>local BBS.

>I was able to find the missing parts on another BBS and I have posted it to
>this group as Sat FAQ Answers, the title under which it was posted to the
>BBS network.

>I presume that further posting is OK with the original authors. What I
>posted seems to be a composite of several different articles and it isn't
>clear who wrote what or who edited the composite document.

Well, if such an FAQ is going to be posted, someone should take
responsibility for doing it (either the original author, or a proxy).
That way, it's clear who is accepting and merging in changes and
feedback. Also, a single poster has knowledge of when it was last
posted, and (hopefully) will post it on a regular schedule (not every
week, but not just once a year either).

Else we may have just a lot of chaos and arguments.

Opinions?

73, Paul W. Schleck, KD3FU
pschleck@unomaha.edu

422. TF active on AO-13.

Newsgroup: rec.radio.amateur.space
Date: 1994-03-20 22:43:33 UTC
From: bnt@rhi.hi.is
Message-ID: <2mijil$imt@eldborg.rhi.hi.is>
Source record: 27675

Hello All.
Sunday the 20th of March we put up an ground station
for AO-13 to show Amateur radio through satellites in
a open house of the Technical School of Reykjavik.
There is now a working amateur club in this school that
hopes to get fundings to buy a rotor and a FT-736R
and put up antenna s for satellite work.

Now we have up a station witch consists of:

FT-736R full-duplex all mode transceiver.
RFconcepts 30w in 100W out amlifier on 70cm.
ARR. preamplifier on 2m.
Yaesu G-5600 az/el Rotor.
Tonna 2x9 elements on 2m and 2x19 on 70cm.

All the equipment comes from TF3TXT and TF3BNT.
We are going to operate AO-13, AO-10, AO-21, AO-27,
from the 20th of march, and hopefully to friday the 25th.

After that I (TF3BNT) and TF3TXT are going to put up our
Mode-B gear and be active all summer, Allso look for TF8ITT,
Ps. We are going to be active on MODE-S later in the summer.
(we hope).
As soon as the weather conditions get better, We will put up
our gear and be ready for action. :-)

So I say 73 de TF3BNT

My adress is :

Benedikt Sveinsson TF3BNT
Hateigsveg 2
105 Reykjavik
Iceland

e-mail : bnt@rhi.hi.is

73 CUL on AO-10,AO-13,AO-21,AO-27 and PHASE 3D hopfully someday.

423. RE: Frustration ... Just try a new one

Newsgroup: rec.radio.amateur.space
Date: 1994-03-21 07:26:54 UTC
From: hansky@MB3.TU-Chemnitz.DE
Message-ID: <hansky.764234814@Otto>
Source record: 27676

Just try a new tracking program...

Get it by anonymous ftp to: igel.physik.th-zwickau.de

Opinions are welcome.

73's de Karsten - DL3HRT

e-mail: hansky@igel.physik.th-zwickau.de

424. dx on RS-10...

Newsgroup: rec.radio.amateur.space
Date: 1994-03-21 11:02:13 UTC
From: hansky@MB3.TU-Chemnitz.DE
Message-ID: <hansky.764247733@Otto>
Source record: 27678

Yesterday I worked a VE2-stn on RS-10. I'm looking out for some other dx-stations which would try to make a dx-contact via rs-10.

My QTH is in jo61ab (12E and 51N), near Leipzig.

Everybody is invited to make up a sket. The max. distance from my QTH covers the east-coast of USA down to Boston. A distance of 5000-6000km from my QTH should be possible.

73's de Karsten - DL3HRT.

Please e-mail to: hansky@igel.physik.th-zwickau.de

425. FAQ Available?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-21 18:56:18 UTC
From: jangus@skyld.grendel.com
Message-ID: <764276178snx@skyld.grendel.com>
Source record: 27679

In article <pschleck.764203024@cwis> pschleck@cwis.unomaha.edu writes:

> Well, if such an FAQ is going to be posted, someone should take
> responsibility for doing it (either the original author, or a proxy).
> That way, it's clear who is accepting and merging in changes and
> feedback. Also, a single poster has knowledge of when it was last
> posted, and (hopefully) will post it on a regular schedule (not every
> week, but not just once a year either).

And once it is straightened out, place it over on rtfm.mit.edu
in the /pub/usenet-by-group/rec.radio.amateur.space directory.

Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA | "You have a flair for adding
Internet: jangus@skyld.grendel.com | a fanciful dimension to any
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426. Two-Line Orbital Element Sets (TLE362)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-22 00:44:04 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.764297044@afit.af.mil>
Source record: 27680

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #362 -
Alouette 1
1 00424U 62049 94080.20365078 .00000086 00000-0 90645-4 0 9771
2 00424 80.4633 11.8093 0023723 344.6803 15.3621 13.67802591570375
ATS 3
1 03029U 67111A 94080.23265194 -.00000109 00000-0 10000-3 0 1709
2 03029 14.5921 8.3829 0010187 272.8062 235.7297 1.00272727 96550
Cosmos 398
1 04966U 71016A 94080.03295714 .00128548 72448-5 28283-3 0 773
2 04966 51.4463 311.7014 1113721 105.9707 266.6560 13.67534666760586
Starlette
1 07646U 75010A 94076.25670951 -.00000163 00000-0 -13962-4 0 7644
2 07646 49.8268 156.1251 0205965 32.5401 328.7998 13.82185234965132
LAGEOS
1 08820U 76039A 94075.55999333 .00000021 00000-0 10000-3 0 9766
2 08820 109.8325 103.8774 0044526 304.9779 54.6733 6.38664252161231
ETS-2
1 09852U 77014A 94070.85048620 -.00000159 00000-0 10000-3 0 9581
2 09852 11.9850 42.6477 0002572 4.2921 155.3539 0.99995589 9681
GOES 2
1 10061U 77048A 94074.26046228 .00000075 00000-0 10000-3 0 3077
2 10061 11.0283 46.8553 0001878 353.0579 90.3195 1.00272526 6178
IUE
1 10637U 78012A 94080.16269733 -.00000199 00000-0 10000-3 0 9841
2 10637 34.4736 96.3350 1310527 33.2407 55.9388 1.00295516 11841
GPS BI-01
1 10684U 78020A 94074.32885725 -.00000023 00000-0 10000-3 0 2588
2 10684 64.5956 48.3212 0063760 163.1248 197.0565 1.98068887103072
GPS BI-02
1 10893U 78047A 94065.58910434 .00000012 00000-0 10000-3 0 522
2 10893 63.6061 287.7168 0212452 13.8448 346.8569 2.01627547116001
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GOES 3
1 10953U 78062A 94079.35186598 .00000076 00000-0 10000-3 0 2850
2 10953 9.9690 49.5175 0004673 108.1221 332.6278 1.00288915 10836
SeaSat 1
1 10967U 78064A 94080.18669116 .00000036 00000-0 56684-4 0 2723
2 10967 108.0039 280.1069 0001500 266.3399 93.7569 14.37937675823718
GPS BI-03
1 11054U 78093A 94072.64281407 -.00000004 00000-0 10000-3 0 1667
2 11054 63.2833 284.5652 0043240 175.2975 184.7848 1.93505803112669
Nimbus 7
1 11080U 78098A 94076.19224552 -.00000010 00000-0 29466-4 0 3760
2 11080 99.0685 323.1983 0009568 23.2190 336.9394 13.83732607777359
GPS BI-04
1 11141U 78112A 94074.00892174 -.00000024 00000-0 00000+0 0 8683
2 11141 64.5991 49.3811 0048280 24.0304 336.1673 1.92894558 1961
GPS BI-05
1 11690U 80011A 94069.18665568 -.00000017 00000-0 10000-3 0 7654
2 11690 64.9028 50.2893 0151049 184.3059 175.5313 2.00554800117553
GPS BI-06
1 11783U 80032A 94072.64449619 -.00000003 00000-0 10000-3 0 9581
2 11783 62.6978 281.4300 0209013 29.2773 331.9034 2.03456647102017
GOES 5
1 12472U 81049A 94080.23389262 .00000099 00000-0 10000-3 0 7578
2 12472 6.6417 59.0977 0005188 348.8352 73.8911 1.00287063 4880
Cosmos 1383
1 13301U 82066A 94076.24349947 .00000026 00000-0 13623-4 0 2741
2 13301 82.9313 17.1654 0028025 351.7860 8.2840 13.68052343584854
LandSat 4
1 13367U 82072A 94074.12287360 .00000020 00000-0 14542-4 0 4562
2 13367 98.1905 134.3087 0007024 178.2022 181.9238 14.57125548620366
IRAS
1 13777U 83004A 94079.53065856 .00000270 00000-0 21618-3 0 5780
2 13777 98.9740 272.3152 0012208 194.6283 165.4538 13.99196381238748
Cosmos 1447
1 13916U 83021A 94080.24653568 .00000019 00000-0 44270-5 0 3765
2 13916 82.9407 76.7416 0036454 275.5808 84.1183 13.74305874551255
TDRS 1
1 13969U 83026B 94078.70586141 -.00000186 00000-0 10000-4 0 2845
2 13969 7.5333 52.0010 0025684 185.1816 278.5267 1.00257514 13156
GOES 6
1 14050U 83041A 94073.19119641 -.00000153 00000-0 10000-3 0 1818
2 14050 5.3958 61.9003 0003632 305.6164 137.2952 1.00219775 11834
OSCAR 10
1 14129U 83058B 94078.88849305 -.00000143 00000-0 10000-3 0 2710
2 14129 27.1881 336.3846 6021341 163.5017 230.9609 2.05878514 52971
LandSat 5
1 14780U 84021A 94080.20389422 .00000119 00000-0 36372-4 0 421
2 14780 98.1730 141.6769 0004943 160.7420 199.3966 14.57127211534662
UoSat 2
1 14781U 84021B 94076.08262229 .00000387 00000-0 73489-4 0 6746
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2 14781 97.7911 95.1034 0010946 200.8625 159.2135 14.69171604536786
GPS BI-09
1 15039U 84059A 94075.99264555 -.00000016 00000-0 10000-3 0 1785
2 15039 63.9137 43.9372 0057003 218.7796 140.7972 2.00559411 71490
Cosmos 1574
1 15055U 84062A 94079.64139878 .00000064 00000-0 51571-4 0 5754
2 15055 82.9557 130.3584 0029234 101.6120 258.8317 13.73602546488471
GPS BI-10
1 15271U 84097A 94079.90233661 .00000042 00000-0 10000-3 0 7812
2 15271 62.3990 281.1869 0144071 348.3745 11.3254 2.00579105 68686
Cosmos 1602
1 15331U 84105A 94076.22561697 .00000783 00000-0 90103-4 0 2667
2 15331 82.5357 163.8287 0020831 141.9191 218.3478 14.84340127510878
NOAA 9
1 15427U 84123A 94074.03402688 .00000126 00000-0 90853-4 0 7505
2 15427 99.0656 123.3704 0015705 122.8642 237.4045 14.13597974477046
GPS BI-11
1 16129U 85093A 94075.16034284 -.00000018 00000-0 10000-3 0 5740
2 16129 64.6618 46.0902 0130933 140.7690 220.1740 2.00563629 8297
Mir
1 16609U 86017A 94079.99044221 .00007753 00000-0 10653-3 0 5350
2 16609 51.6458 268.3855 0015411 56.6232 303.6222 15.58264746462295
SPOT 1
1 16613U 86019A 94079.78420752 .00000089 00000-0 62356-4 0 6580
2 16613 98.6964 154.9723 0000949 82.2680 277.8599 14.20049445104016
Cosmos 1766
1 16881U 86055A 94079.39021863 .00000774 00000-0 91255-4 0 1838
2 16881 82.5172 218.8975 0019257 154.5969 205.6179 14.83376495412292
EGP
1 16908U 86061A 94080.21462082 -.00000097 00000-0 00000+0 0 8727
2 16908 50.0125 354.8611 0011625 89.5325 270.6842 12.44409280 14439
NOAA 10
1 16969U 86073A 94073.99072129 .00000108 00000-0 64636-4 0 6475
2 16969 98.5121 85.8616 0012156 244.1267 115.8662 14.24872785389191
MOS-1
1 17527U 87018A 94075.81279067 .00000091 00000-0 99794-4 0 501
2 17527 99.0422 146.4065 0000718 84.1394 275.9843 13.94899872360064
GOES 7
1 17561U 87022A 94070.63093101 -.00000061 00000-0 10000-3 0 7723
2 17561 1.3408 76.8522 0005043 347.7640 219.1757 1.00271958 8992
Kvant-1
1 17845U 87030A 94079.92629794 .00003919 00000-0 57214-4 0 7881
2 17845 51.6458 268.7114 0015637 53.0544 307.1058 15.58258156462358
DMSP B5D2-3
1 18123U 87053A 94073.98898881 .00000110 00000-0 78715-4 0 3594
2 18123 98.7902 267.0725 0015175 87.7073 272.5839 14.15342428347680
RS-10/11
1 18129U 87054A 94079.84948217 .00000032 00000-0 18660-4 0 8839
2 18129 82.9229 34.1304 0010237 273.8387 86.1598 13.72333391337792
Meteor 2-16
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1 18312U 87068A 94080.03226527 .00000051 00000-0 32248-4 0 2736
2 18312 82.5518 281.7765 0013002 6.3192 353.8129 13.84025791332862
Meteor 2-17
1 18820U 88005A 94076.18240290 .00000127 00000-0 99308-4 0 2729
2 18820 82.5456 341.7797 0018514 79.0102 281.3131 13.84711418309624
DMSP B5D2-4
1 18822U 88006A 94073.97879900 .00000110 00000-0 67643-4 0 4633
2 18822 98.4545 292.7874 0005433 263.7866 96.2706 14.22935959317123
Glonass 34
1 19163U 88043A 94068.46776426 .00000044 00000-0 10000-3 0 8735
2 19163 65.0027 113.7828 0007968 170.2805 189.8191 2.13101818 44533
Glonass 36
1 19165U 88043C 94073.21615715 .00000039 00000-0 10000-3 0 2692
2 19165 64.9936 113.5975 0004805 330.7001 29.3479 2.13101907 45257
METEOSAT 3
1 19215U 88051A 94076.10089024 -.00000257 00000-0 10000-3 0 8819
2 19215 1.5249 73.0557 0002867 281.7343 141.2162 1.00259403 8996
AO-13
1 19216U 88051B 94079.56167208 -.00000427 00000-0 10000-4 0 8960
2 19216 57.8735 262.2374 7209738 337.3974 2.4979 2.09727288 12654
OKEAN 1
1 19274U 88056A 94072.74396961 .00000711 00000-0 86235-4 0 8825
2 19274 82.5156 324.9574 0019672 329.7451 30.2620 14.82126616306944
Meteor 3-2
1 19336U 88064A 94072.89393314 .00000051 00000-0 10000-3 0 2689
2 19336 82.5411 31.1102 0017651 137.2192 223.0298 13.16965600270718
Glonass 39
1 19503U 88085C 94072.30293995 -.00000072 00000-0 10000-3 0 1658
2 19503 65.7457 352.5684 0005959 178.4049 181.6518 2.13102126 42721
NOAA 11
1 19531U 88089A 94073.96248747 .00000086 00000-0 71361-4 0 5590
2 19531 99.1660 60.5963 0012728 40.9981 319.2144 14.12967309281919
TDRS 2
1 19548U 88091B 94076.22605189 -.00000289 00000-0 10000-3 0 8973
2 19548 0.8131 78.3475 0002303 270.7535 204.9243 1.00275984 7280
Glonass 40
1 19749U 89001A 94071.40408692 .00000048 00000-0 10000-3 0 3767
2 19749 64.9523 113.2723 0007205 263.0776 96.9469 2.13101586 40212
Glonass 41
1 19750U 89001B 94079.43808937 .00000057 00000-0 10000-3 0 2653
2 19750 64.9701 113.0487 0008441 249.7944 110.1804 2.13102168 40408
GPS BII-01
1 19802U 89013A 94072.49793063 .00000015 00000-0 10000-3 0 8768
2 19802 55.0979 143.5174 0034069 177.6657 182.4328 2.00575606 37136
Akebono
1 19822U 89016A 94079.81996681 .00011285 00000-0 55409-3 0 2292
2 19822 75.0807 232.3488 3832749 355.5741 1.8635 7.76641334102420
Meteor 2-18
1 19851U 89018A 94075.85339731 .00000027 00000-0 10933-4 0 2716
2 19851 82.5182 217.5195 0015409 122.8587 237.3935 13.84358686254919
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MOP-1
1 19876U 89020B 94070.25382735 -.00000073 00000-0 00000+0 0 75
2 19876 0.2432 52.6581 0005157 271.2893 291.5742 1.00203059 90
TDRS 3
1 19883U 89021B 94075.56912773 -.00000272 00000-0 00000+0 0 8905
2 19883 0.0420 57.0217 0004583 132.4063 148.2991 1.00266553 88534
GPS BII-02
1 20061U 89044A 94079.82290816 -.00000045 00000-0 10000-3 0 9016
2 20061 54.7204 320.0614 0126998 207.0190 152.3752 2.00566687 35028
Nadezhda 1
1 20103U 89050A 94079.81177630 .00000057 00000-0 43816-4 0 9752
2 20103 82.9608 352.9331 0037050 173.5489 186.6148 13.73834471236173
GPS BII-03
1 20185U 89064A 94074.17854113 .00000012 00000-0 10000-3 0 8847
2 20185 54.9179 144.0805 0009947 253.8384 106.1187 2.00577472 33483
GMS 4
1 20217U 89070A 94074.74108910 -.00000290 00000-0 10000-3 0 9974
2 20217 0.0530 351.8329 0000802 99.3024 128.8377 1.00265314 17152
GPS BII-04
1 20302U 89085A 94075.70471084 .00000007 00000-0 10000-3 0 8959
2 20302 53.6401 260.5674 0002676 300.4261 59.5597 2.00563869 32313
Meteor 3-3
1 20305U 89086A 94080.17674336 .00000044 00000-0 10000-3 0 59
2 20305 82.5561 330.8403 0006709 142.2127 217.9459 13.04425635211421
COBE
1 20322U 89089A 94075.59463964 .00000218 00000-0 16768-3 0 9862
2 20322 98.9818 92.9297 0009120 163.2870 196.8596 14.03436666221403
Kvant-2
1 20335U 89093A 94079.92629794 .00003919 00000-0 57214-4 0 8702
2 20335 51.6458 268.7114 0015637 53.0544 307.1058 15.58258156462266
GPS BII-05
1 20361U 89097A 94075.71134448 .00000005 00000-0 10000-3 0 7797
2 20361 55.4721 85.9595 0071084 107.3909 253.4278 2.00559817 21795
SPOT 2
1 20436U 90005A 94074.39806657 .00000095 00000-0 65161-4 0 7666
2 20436 98.7257 150.1976 0001448 111.9045 248.2282 14.20026955214786
UO-14
1 20437U 90005B 94072.21549149 .00000072 00000-0 44764-4 0 9737
2 20437 98.5925 158.2846 0011701 110.0876 250.1559 14.29829808215874
UO-15
1 20438U 90005C 94072.24705666 .00000026 00000-0 27237-4 0 7732
2 20438 98.5937 157.3978 0010806 112.8424 247.3898 14.29167228215806
PACSAT
1 20439U 90005D 94076.19336562 .00000065 00000-0 42387-4 0 7743
2 20439 98.6002 163.3475 0012127 99.9777 260.2776 14.29885704216451
DO-17
1 20440U 90005E 94076.22662674 .00000074 00000-0 45623-4 0 7730
2 20440 98.6015 163.6736 0012240 99.1450 261.1119 14.30024568216474
WO-18
1 20441U 90005F 94072.21203773 .00000059 00000-0 39794-4 0 7743
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2 20441 98.6013 159.7138 0012829 111.2783 248.9762 14.29998941215900
LO-19
1 20442U 90005G 94080.24263321 .00000078 00000-0 46967-4 0 7742
2 20442 98.6015 167.8834 0013223 87.9281 272.3415 14.30095566217065
GPS BII-06
1 20452U 90008A 94074.61765746 .00000007 00000-0 10000-3 0 8806
2 20452 54.0603 200.3165 0053792 73.7698 286.8130 2.00572443 30273
MOS-1B
1 20478U 90013A 94075.21245715 .00000091 00000-0 10000-3 0 5996
2 20478 99.0396 149.9393 0000178 141.1993 218.9181 13.94900008129681
DEBUT
1 20479U 90013B 94076.00704044 -.00000024 00000-0 17972-4 0 7704
2 20479 99.0231 245.3938 0540623 188.0174 171.2038 12.83316291192315
FO-20
1 20480U 90013C 94071.45658699 -.00000021 00000-0 25451-4 0 6688
2 20480 99.0216 241.6090 0540420 198.5456 159.5252 12.83224395191726
MOS-1B R/B
1 20491U 90013D 94075.08046572 -.00000437 00000-0 -76323-3 0 9783
2 20491 99.0304 287.0861 0470466 65.9745 298.9834 13.02980050194531
LACE
1 20496U 90015A 94073.24275515 .00004103 00000-0 13630-3 0 3796
2 20496 43.1004 228.3717 0010314 111.8192 248.3760 15.32566103226953
Nadezhda 2
1 20508U 90017A 94079.51082926 .00000074 00000-0 61865-4 0 9759
2 20508 82.9557 127.8317 0045418 125.3707 235.1706 13.73472177203370
OKEAN 2
1 20510U 90018A 94072.06890764 .00000608 00000-0 80287-4 0 2826
2 20510 82.5205 274.1109 0019410 139.0894 221.1779 14.78281142217462
INTELSAT-6
1 20523U 90021A 94072.60611456 -.00000253 00000-0 10000-3 0 3826
2 20523 0.0070 167.1745 0000404 163.3226 24.1450 1.00268304 7640
GPS BII-07
1 20533U 90025A 94075.02593124 -.00000066 00000-0 10000-3 0 8839
2 20533 55.0525 320.7131 0044338 81.0017 279.5543 2.00569742 29059
PegSat
1 20546U 90028A 94074.89108357 .00009425 00000-0 23355-3 0 5998
2 20546 94.1118 245.4801 0075174 292.9678 66.3657 15.37499194217920
HST
1 20580U 90037B 94080.23738730 .00000835 00000-0 68306-4 0 4592
2 20580 28.4697 80.9010 0005913 249.5279 110.4672 14.90534070 16255
MACSAT 2
1 20608U 90043B 94080.27651141 .00000357 00000-0 58652-4 0 9748
2 20608 89.9298 180.3763 0108775 39.2158 321.6869 14.64679391206415
Glonass 44
1 20619U 90045A 94073.65047551 -.00000067 00000-0 00000+0 0 312
2 20619 65.3442 352.1660 0022545 216.0609 143.8033 2.13102949 29711
Glonass 45
1 20620U 90045B 94079.40023640 -.00000057 00000-0 00000+0 0 348
2 20620 65.3364 351.9611 0007925 26.0919 333.9976 2.13102550 29870
Glonass 46
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1 20621U 90045C 94074.77210043 -.00000063 00000-0 10000-3 0 6820
2 20621 65.3623 352.1655 0013438 200.7720 159.2539 2.13102477 29778
Kristall
1 20635U 90048A 94079.92629794 .00003919 00000-0 57214-4 0 6637
2 20635 51.6458 268.7114 0015637 53.0544 307.1058 15.58258156462247
ROSAT
1 20638U 90049A 94074.54971055 .00000700 00000-0 65615-4 0 2796
2 20638 52.9851 51.0288 0014223 140.7716 219.4306 15.06715895207969
Meteor 2-19
1 20670U 90057A 94080.04388230 .00000024 00000-0 79036-5 0 7742
2 20670 82.5426 278.4813 0017557 35.8879 324.3453 13.84190186188420
CRRES
1 20712U 90065A 94079.64247841 .00000793 00000-0 11661-2 0 8767
2 20712 17.7021 224.0715 7187968 122.7704 326.2829 2.35097880 23809
GPS BII-08
1 20724U 90068A 94070.35843482 .00000006 00000-0 10000-3 0 7757
2 20724 54.7323 141.9176 0109621 159.7977 200.6992 2.00562084 26388
Feng Yun1-2
1 20788U 90081A 94079.93711913 -.00000142 00000-0 -65847-4 0 9225
2 20788 98.8389 102.8889 0013311 253.6549 106.3164 14.01311670181343
Meteor 2-20
1 20826U 90086A 94071.91097536 .00000059 00000-0 40218-4 0 7814
2 20826 82.5228 222.5667 0012920 323.8660 36.1626 13.83574515174445
GPS BII-09
1 20830U 90088A 94079.38690504 .00000036 00000-0 10000-3 0 7768
2 20830 55.4136 83.8661 0065292 105.2471 255.5119 2.00560300 25646
GPS BIIA-10
1 20959U 90103A 94074.30261751 .00000011 00000-0 10000-3 0 6855
2 20959 54.9336 143.6313 0082685 224.4266 134.9789 2.00567717 24139
DMSP B5D2-5
1 20978U 90105A 94074.00424958 .00000251 00000-0 10517-3 0 5651
2 20978 98.6972 137.3401 0080435 81.5249 279.5041 14.32389487171621
Glonass 47
1 21006U 90110A 94079.49479881 .00000058 00000-0 00000+0 0 6314
2 21006 64.9337 112.3714 0059983 188.3355 171.6470 2.13102891 25548
Glonass 48
1 21007U 90110B 94079.21073976 .00000055 00000-0 00000+0 0 7330
2 21007 64.9555 112.4362 0036248 183.0444 176.9998 2.13100971 25530
Glonass 49
1 21008U 90110C 94073.93564391 .00000035 00000-0 00000+0 0 7349
2 21008 64.9351 112.5747 0010896 280.7228 79.2294 2.13099604 25409
AO-21
1 21087U 91006A 94072.89324047 .00000094 00000-0 82657-4 0 4443
2 21087 82.9367 213.2088 0035958 352.1754 7.8836 13.74535804156493
RS-12/13
1 21089U 91007A 94079.90823919 .00000032 00000-0 18216-4 0 6733
2 21089 82.9180 76.9195 0029938 357.6064 2.4956 13.74037183156521
MOP-2
1 21140U 91015B 94079.66369492 -.00000023 00000-0 00000+0 0 6811
2 21140 0.2171 341.0630 0001202 55.5803 18.9696 1.00272691 365
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Nadezhda 3
1 21152U 91019A 94079.85407535 .00000052 00000-0 39206-4 0 7738
2 21152 82.9233 32.6332 0043419 100.3263 260.2793 13.73498156151266
Glonass 50
1 21216U 91025A 94079.04340030 -.00000058 00000-0 10000-3 0 2780
2 21216 65.1035 351.7785 0009002 209.0445 150.9422 2.13103796 23049
Glonass 51
1 21217U 91025B 94080.04728837 -.00000057 00000-0 00000+0 0 6348
2 21217 65.0958 351.7433 0011113 243.0494 116.8714 2.13101933 23058
Glonass 52
1 21218U 91025C 94072.65381633 -.00000071 00000-0 10000-3 0 1735
2 21218 65.0190 351.9751 0007122 310.2157 49.7549 2.13102551 22900
GRO
1 21225U 91027B 94079.53676843 .00004336 00000-0 97694-4 0 752
2 21225 28.4636 127.3366 0003390 287.6252 72.3973 15.40420925 43255
Meteor 3-4
1 21232U 91030A 94071.87651682 .00000051 00000-0 10000-3 0 6792
2 21232 82.5362 237.6665 0014715 65.8899 294.3776 13.16460820138681
NOAA 12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
OKEAN 3
1 21397U 91039A 94072.78308944 .00000757 00000-0 10603-3 0 9845
2 21397 82.5257 185.0492 0021295 207.9246 152.0822 14.76156585149430
GPS BIIA-11
1 21552U 91047A 94072.57993581 -.00000001 00000-0 10000-3 0 6897
2 21552 55.7203 81.6799 0056516 236.7050 122.7847 2.00566645 19695
ERS-1
1 21574U 91050A 94079.80513390 .00000051 00000-0 33931-4 0 4132
2 21574 98.5211 155.5494 0001092 100.5795 259.5507 14.34152758140029
UO-22
1 21575U 91050B 94079.70081566 .00000111 00000-0 52198-4 0 4769
2 21575 98.4399 155.9592 0007223 188.8493 171.2552 14.36900838140375
ORBCOMM-X
1 21576U 91050C 94076.18613169 .00000163 00000-0 70549-4 0 5745
2 21576 98.4429 151.4564 0003183 201.1956 158.9101 14.36293202139802
TUBSAT-A
1 21577U 91050D 94080.18970547 .00000078 00000-0 41293-4 0 4745
2 21577 98.4422 155.8008 0006147 188.4004 171.7079 14.36429950140407
SARA
1 21578U 91050E 94080.20012563 .00000511 00000-0 18075-3 0 6716
2 21578 98.4523 158.6813 0004689 187.7587 172.3526 14.38714900140556
TDRS 4
1 21639U 91054B 94079.31354862 .00000077 00000-0 10000-3 0 7054
2 21639 0.0467 289.8982 0001960 184.3356 1.9033 1.00270929 7689
Meteor 3-5
1 21655U 91056A 94080.22430161 .00000051 00000-0 10000-3 0 6885
2 21655 82.5573 178.8593 0014769 59.6601 300.6003 13.16828445124883
UARS
1 21701U 91063B 94080.26774542 -.00000180 00000-0 53077-5 0 4923
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2 21701 56.9825 151.3728 0004501 94.8570 265.2971 14.96521221137778
DMSP B5D2-6
1 21798U 91082A 94073.96500505 .00000174 00000-0 11591-3 0 2243
2 21798 98.9645 79.5916 0013895 47.7982 312.4367 14.13774989118302
Glonass 53
1 21853U 92005A 94070.52015571 .00000051 00000-0 10000-3 0 8765
2 21853 64.8780 112.3866 0006659 204.8804 155.1591 2.13102304 16463
Glonass 54
1 21854U 92005B 94075.50519401 .00000032 00000-0 00000+0 0 9350
2 21854 64.8856 112.2106 0016120 8.5730 351.5267 2.13103366 16556
Glonass 55
1 21855U 92005C 94079.32006716 .00000056 00000-0 00000+0 0 9362
2 21855 64.8863 112.0933 0007844 218.3560 141.6542 2.13102610 16629
JERS-1
1 21867U 92007A 94079.75168771 .00000063 00000-0 10000-4 0 2541
2 21867 97.6467 156.2805 0002611 109.2174 250.9351 14.98648188115139
GPS BIIA-12
1 21890U 92009A 94079.52463466 .00000032 00000-0 10000-3 0 4865
2 21890 54.1689 260.4231 0057167 162.6389 197.5629 2.00571544 15209
GPS BIIA-13
1 21930U 92019A 94066.27012431 -.00000077 00000-0 10000-3 0 4726
2 21930 55.5517 21.9202 0053073 168.2863 191.8372 2.00563452 13869
EUVE
1 21987U 92031A 94074.09677076 .00002923 00000-0 12904-3 0 2761
2 21987 28.4340 325.0646 0010098 27.9778 332.1355 15.18292667 98088
SAMPEX
1 22012U 92038A 94072.18467771 .00000881 00000-0 75652-4 0 4982
2 22012 81.6704 272.1366 0120093 353.6226 6.3454 14.90878538 91975
GPS BIIA-14
1 22014U 92039A 94071.78638211 -.00000019 00000-0 10000-3 0 3819
2 22014 54.8977 201.5845 0082988 297.5970 61.5250 2.00566146 5813
Glonass 56
1 22056U 92047A 94074.99739800 -.00000064 00000-0 00000+0 0 8287
2 22056 64.9292 352.1306 0005710 288.6380 71.3327 2.13103314 12629
Glonass 57
1 22057U 92047B 94073.41434781 -.00000068 00000-0 00000+0 0 8334
2 22057 64.9466 352.2000 0008819 322.4067 37.5605 2.13102662 12568
Glonass 58
1 22058U 92047C 94079.45564617 -.00000058 00000-0 00000+0 0 8493
2 22058 64.9337 352.0034 0009969 284.5714 75.3590 2.13103766 12744
TOPEX
1 22076U 92052A 94079.50135808 -.00000038 00000-0 10000-3 0 7381
2 22076 66.0396 115.2131 0007854 265.8557 94.1561 12.80930276 75135
KO-23
1 22077U 92052B 94076.18255996 -.00000037 00000-0 10000-3 0 3705
2 22077 66.0833 112.6185 0011519 310.3641 49.6367 12.86285535 74950
S80/T
1 22078U 92052C 94072.16850376 -.00000037 00000-0 10000-3 0 3680
2 22078 66.0841 120.4081 0012767 313.0634 46.9313 12.86567138 74504
GPS BIIA-15
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1 22108U 92058A 94075.23998004 .00000004 00000-0 10000-3 0 3786
2 22108 54.3984 261.2734 0108169 135.6306 225.2333 2.00552756 11062
FREJA
1 22161U 92064A 94080.23320383 .00000240 00000-0 15932-3 0 3845
2 22161 63.0069 155.1936 0779539 307.4120 45.8346 13.21742470 70171
LAGEOS II
1 22195U 92070B 94076.23222669 -.00000009 00000-0 10000-3 0 2734
2 22195 52.6457 151.8002 0138591 77.1990 284.4017 6.47293891 32995
GPS BIIA-16
1 22231U 92079A 94069.44632585 -.00000040 00000-0 10000-3 0 3760
2 22231 54.6910 202.8826 0016257 317.1886 42.6271 2.00560160 9528
GPS BIIA-17
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2 22275 54.6713 200.2957 0051871 254.1787 105.2180 2.00559138 9017
TDRS 5
1 22314U 93003B 94080.03418433 -.00000285 00000-0 10000-3 0 3796
2 22314 0.9142 72.9825 0002754 288.5094 143.2066 1.00264801 4443
GPS BIIA-18
1 22446U 93007A 94079.13885035 -.00000050 00000-0 10000-3 0 3780
2 22446 54.7164 320.9532 0072583 341.6673 18.0585 2.00578172 8115
Glonass 59
1 22512U 93010A 94079.43677246 .00000057 00000-0 00000+0 0 5406
2 22512 64.9009 111.9384 0009189 209.7093 150.2864 2.13102344 8224
Glonass 60
1 22513U 93010B 94074.21538638 .00000034 00000-0 00000+0 0 5538
2 22513 64.8894 112.1243 0007201 211.8687 148.1617 2.13102576 8307
Glonass 61
1 22514U 93010C 94079.61293328 .00000059 00000-0 00000+0 0 5348
2 22514 64.9037 111.9163 0013797 198.6556 161.3715 2.13102252 8420
ASTRO-D
1 22521U 93011A 94074.90327631 .00001324 00000-0 10954-3 0 2727
2 22521 31.1050 301.8017 0076853 261.4426 97.7462 14.93066265 58143
UFO F1
1 22563U 93015A 94069.53546134 -.00000063 00000-0 10000-3 0 2655
2 22563 26.8313 301.2608 0006039 343.1031 346.1573 0.99246820 7855
GPS BIIA-19
1 22581U 93017A 94065.81500392 -.00000076 00000-0 10000-3 0 2788
2 22581 55.0670 21.7217 0045865 31.6294 328.6264 2.00570893 6906
ARSENE
1 22654U 93031B 94064.50000000 -.00000119 00000-0 00000+0 0 2469
2 22654 1.6510 105.2680 2927552 173.8780 198.1380 1.42201225 2991
GPS BIIA-20
1 22657U 93032A 94074.92212204 -.00000072 00000-0 10000-3 0 2813
2 22657 55.0940 21.1537 0036805 221.9668 137.7216 2.00561965 2410
GPS BIIA-21
1 22700U 93042A 94075.88439822 .00000010 00000-0 10000-3 0 2772
2 22700 54.5838 261.9667 0024688 320.4958 39.3357 2.00573956 5239
NOAA 13
1 22739U 93050A 94079.85481121 .00000041 00000-0 47682-4 0 3720
2 22739 98.9385 24.6288 0010656 15.3425 344.8066 14.10886535 31506
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GPS BIIA-22
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2 22779 54.8372 320.8318 0022814 231.1882 128.6706 2.00566572 4079
Meteor 2-21
1 22782U 93055A 94072.07378319 .00000044 00000-0 26732-4 0 2819
2 22782 82.5479 282.6058 0022877 131.3043 229.0093 13.83002641 26809
UFO F2
1 22787U 93056A 94079.67885247 -.00000075 00000-0 10000-3 0 2670
2 22787 4.9144 323.2526 0003933 31.9963 139.1715 1.00273077 365
SPOT 3
1 22823U 93061A 94072.39560861 .00000169 00000-0 10000-3 0 2821
2 22823 98.7195 148.2993 0001083 93.6594 266.4714 14.20028833 23895
STELLA
1 22824U 93061B 94072.20677596 -.00000037 00000-0 27916-5 0 2704
2 22824 98.6597 148.8843 0007111 123.8647 236.3212 14.27095549 23988
AO-27
1 22825U 93061C 94072.21774410 .00000113 00000-0 63718-4 0 2702
2 22825 98.6611 148.9612 0009401 126.7150 233.4895 14.27613170 23998
IO-26
1 22826U 93061D 94072.20569811 .00000134 00000-0 71926-4 0 2702
2 22826 98.6611 148.9734 0009962 126.0055 234.2050 14.27715988 23995
HEATHSAT
1 22827U 93061E 94080.18235861 .00000095 00000-0 56192-4 0 3349
2 22827 98.6573 156.8525 0010090 91.2243 269.0096 14.27824034 25132
PO-28
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2 22829 98.6566 149.0227 0010769 114.2722 245.9582 14.28010738 24007
KO-25
1 22830U 93061H 94076.16166154 .00000077 00000-0 48244-4 0 2746
2 22830 98.5601 151.1197 0012546 85.4566 274.8057 14.28040646 24568
GPS BIIA-23
1 22877U 93068A 94074.53622098 -.00000003 00000-0 10000-3 0 888
2 22877 55.1464 82.2099 0033009 283.9726 75.6927 2.00552265 2853
METEOSAT 6
1 22912U 93073B 94070.52303924 -.00000105 00000-0 00000+0 0 735
2 22912 1.1096 268.4617 0002150 358.4901 80.0303 1.00271668 1182
HST Array
1 22920U 90037C 94076.21818230 .00011034 00000-0 95692-3 0 1024
2 22920 28.4739 102.6986 0003027 14.0679 345.9802 14.95587134 15702
Soyuz TM-18
1 22957U 94001A 94079.92629794 .00003919 00000-0 57214-4 0 712
2 22957 51.6458 268.7114 0015637 53.0544 307.1058 15.58258156 11202
Meteor 3-6
1 22969U 94003A 94075.15435422 .00000127 00000-0 29816-3 0 399
2 22969 82.5614 121.9069 0016163 132.7407 227.5078 13.16720271 6608
TUBSAT-B
1 22970U 94003B 94075.07435960 .00000137 00000-0 32330-3 0 294
2 22970 82.5624 121.9578 0016770 130.9746 229.2843 13.16820618 6599
ProgressM21
1 22975U 94005A 94079.92629794 .00003919 00000-0 57214-4 0 637
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2 22975 51.6458 268.7114 0015637 53.0544 307.1058 15.58258156 8107
ODERACS A
1 22990U 94006B 94080.23587652 .00059836 00000-0 33009-3 0 349
2 22990 56.9887 9.3454 0020707 6.4585 353.6757 15.78879059 6232
ODERACS B
1 22991U 94006C 94075.49608970 .00065394 00000-0 37806-3 0 322
2 22991 56.9850 30.9604 0017953 357.5702 2.5277 15.77882728 5489
ODERACS E
1 22994U 94006F 94079.83953941 .00033248 00000-0 21155-3 0 343
2 22994 56.9884 11.6469 0017819 11.4424 348.6995 15.76016220 6164
ODERACS F
1 22995U 94006G 94079.84142815 .00034331 00000-0 21873-3 0 368
2 22995 56.9874 11.6562 0017600 12.6566 347.4787 15.75976106 6169
BREMSAT
1 22998U 94006H 94079.93375672 .00036258 00000-0 24251-3 0 161
2 22998 56.9901 11.5507 0015380 28.5519 331.6393 15.74885228 6024
Raduga 31
1 23010U 94012A 94079.34840354 .00000125 00000-0 00000+0 0 383
2 23010 1.4454 273.3514 0008604 139.8843 295.5405 1.00254617 315
1994012E
1 23014U 94012E 94073.62509613 .00000123 00000-0 10000-3 0 127
2 23014 47.3586 269.6402 7312404 6.3022 359.3786 2.22788092 559
Galaxy 1R
1 23016U 94013A 94067.90838796 .00000053 00000-0 00000+0 0 61
2 23016 0.0383 138.4446 0003614 273.8017 307.9906 1.00264826 81
1994013B
1 23017U 94013B 94079.74144687 .02444474 -47494-5 66212-3 0 635
2 23017 26.5314 186.0522 1404130 25.8335 340.5943 13.14213230 3628
1994013C
1 23018U 94013C 94079.70349488 -.00000208 00000-0 10000-3 0 157
2 23018 25.5303 315.3086 6485931 8.6263 358.7182 2.02378060 586
KORONAS 1
1 23019U 94014A 94079.50608433 .00001896 00000-0 87093-4 0 133
2 23019 82.4905 219.4846 0029289 177.7857 182.3512 15.19384109 2725
1994014B
1 23020U 94014B 94074.23832995 .00003272 00000-0 15189-3 0 172
2 23020 82.4885 224.7197 0029713 197.4757 162.5457 15.19275366 980
1994014C
1 23021U 94014C 94079.37543835 .00044252 00000-0 14556-2 0 264
2 23021 82.4943 219.3204 0021059 59.1022 301.2251 15.31111519 2797
1994014D
1 23022U 94014D 94079.86603867 .00030300 00000-0 12844-2 0 156
2 23022 82.4858 219.0235 0021194 237.8131 122.1018 15.22783409 2840
1994014E
1 23023U 94014E 94079.46523653 .00028823 00000-0 13736-2 0 155
2 23023 82.4886 219.5842 0050478 158.9853 201.3468 15.17821879 2771
1994014F
1 23024U 94014F 94074.42319501 .00030014 00000-0 13318-2 0 142
2 23024 82.4755 224.3718 0026565 192.2451 167.7953 15.21108036 2028
1994014G
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1 23026U 94014G 94073.91252548 .00027200 00000-0 12722-2 0 156
2 23026 82.5046 225.2071 0031700 207.1333 152.8219 15.19173688 1939
GPS BIIA-24
1 23027U 94016A 94075.73146898 -.00000065 00000-0 63223-3 0 155
2 23027 54.9179 23.2712 0064222 197.9198 161.8430 2.01521440 268
SEDS 2
1 23028U 94016 B 94076.79816675 .00166348 00000-0 10136-2 0 150
2 23028 032.3513 305.3831 0000831 304.6642 055.4448 15.76266173001188
1994016C
1 23029U 94016C 94079.85732511 .00093522 -54600-7 17639-2 0 125
2 23029 34.8886 9.1913 6046590 203.6061 109.6655 4.06151061 518
1994018A
1 23033U 94018A 94079.91466349 .00299107 57024-5 19156-3 0 148
2 23033 67.1286 38.1109 0115259 104.3638 257.0377 16.03931806 528
1994018B
1 23034U 94018B 94079.89403935 .06325792 60748-5 28106-3 0 146
2 23034 67.1225 38.0501 0068787 93.1499 273.5546 16.32086812 510
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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427. Any sat tracking progs available for unix?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-22 12:52:03 UTC
From: robert@plasma.apana.org.au
Message-ID: <2mmplj$uj0@plasma.apana.org.au>
Source record: 27681

Does anyone know of a program preferably written in C (but fortran-77
would suffice I suppose) which will track satellites using the standard
2-line element sets. I would like to compile it up under UNIX. I see
absolutely no reason why these programs should only be available in
a pre-compiled form for mess-doss :-)

Thanks in advance.
--
-Robert Kroes-
robert@plasma.apana.org.au

428. Controling G-5600 az/el rotor with PC.

Newsgroup: rec.radio.amateur.space
Date: 1994-03-22 23:14:09 UTC
From: bnt@rhi.hi.is
Message-ID: <2mnu41$s3g@eldborg.rhi.hi.is>
Source record: 27682

Hello all.

I want to control my Yaesu G-5600B az/el rotor with my PC.
I know that I can buy the Kansas City Tracker for $200, but
I would rather like to spend less money on that and try to
get to Mode-S instead. I have been looking at the ORBITDRV,
that comes with Instant Track and I find it pretty nead.
I tryed to program a RotorDRV program insted of DUMMYKCT, But
OrbitDRV allways returns with RotorDRV not found. I'm looking
for the ASM sourche code for the DummyKct or similar driver.

So please if you can help me in my quest for cheap homemaid
computerized satellite tracking equipment (CHCSTE). Please
post or e-mail.

Designing and building the equipment is no problem, but to
have some TSR program to guide it is the problem, ps. Im ok
in programming in C and ASM, but I only need some information
how to communicate with OrbitDRV.

73 de TF3BNT 'benni.

Benedikt Sveinsson
Hateigsvegur 2
105 Reykjavik
Iceland.

e-mail : bnt@rhi.hi.is

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429. SatSked, TrakBox Beta Rom now on oak.oakland.edu

Newsgroup: rec.radio.amateur.space
Date: 1994-03-22 23:35:44 UTC
From: wroth@netcom.com
Message-ID: <wrothCn3AvM.7FJ@netcom.com>
Source record: 27683

I just uploaded two files to oak.oakland.edu. The first one is called SatSked. I wrote this program to automate a digital pacsat ground station. It requires a registration number from Amsat NA, UK or DL for operation. All proceeds go directly to the Phase IIID satellite launch funds in the respective organization.

The second file is the latest code for the Jamsat/Tapr TrakBox. It features inputs for mike clicks from a PSK modem to keep the doppler shift in check from PSK birds, along with a bunch of new features. Keep in mind this is a BETA release. Here are the two filenames:

pc/satellite/satsked.zip
pc/satellite/trk320a.zip

Good luck tracking!

73's de Wayne Roth
WA2N/5.
--
wroth@netcom.com

430. Telecom and Meteors

Newsgroup: rec.radio.amateur.space
Date: 1994-03-23 00:12:05 UTC
From: cdfore@rs6000.cmp.ilstu.edu
Message-ID: <1994Mar23.001205.21873@rs6000.cmp.ilstu.edu>
Source record: 27684

Help!! I'm Looking for info on using meteors to bounce signals for telecommunication. I saw a show in January on it. Now I have to write a paper on something in telecommunication and as you can see my writing sucks. But I think if I can get some info about something my prof has not hear of it will help. So any one out there with info or know how I can get some please reply.

E-mail cdfore@rs600.cmp.ilstu.edu

Curt Fore lost Student and new i-net user :->

431. Navstar GPS Constellation Status (94-03-23)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-23 14:06:26 UTC
From: lang@unb.ca
Message-ID: <ID7992.D940323.T100416.lang@unb.ca>
Source record: 27685
Cross-posted to: comp.infosystems.gis,rec.aviation.misc,rec.boats,rec.radio.amateur.space,sci.geo.satellite-nav,sci.space.news

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Navstar GPS Constellation Status
(94-03-23)

Blk NASA Orbit Launch
II PRN Internat. Catalog Plane Date
Seq SVN Code ID Number Pos'n (UT) Clock Available/Decommissioned
-------------------------------------------------------------------------------
Block I
01 04 1978-020A 10684 78-02-22 78-03-29 85-07-17
02 07 1978-047A 10893 78-05-13 78-07-14 81-07-16
03 06 1978-093A 11054 78-10-06 78-11-13 92-05-18
04 08 1978-112A 11141 78-12-10 79-01-08 89-10-14
05 05 1980-011A 11690 80-02-09 80-02-27 83-11-28
06 09 1980-032A 11783 80-04-26 80-05-16 91-03-06
07 81-12-18 Launch failure
08 11 1983-072A 14189 83-07-14 83-08-10 93-05-04
09 13 1984-059A 15039 C-1 84-06-13 Rb 84-07-19
10 12 1984-097A 15271 A-1 84-09-08 Rb 84-10-03
11 03 1985-093A 16129 C-4 85-10-09 Rb 85-10-30

Block II
II-1 14 14 1989-013A 19802 E-1 89-02-14 Cs 89-04-15 05:02 UT
II-2 13 02 1989-044A 20061 B-3 89-06-10 Cs 89-08-10 20:46 UT
II-3 16 16 1989-064A 20185 E-3 89-08-18 Cs 89-10-14 20:21 UT
II-4 19 19 1989-085A 20302 A-4 89-10-21 Cs 89-11-23 03:13 UT
II-5 17 17 1989-097A 20361 D-3 89-12-11 Cs 90-01-06 03:30 UT
II-6 18 18 1990-008A 20452 F-3 90-01-24 Cs 90-02-14 22:26 UT
II-7 20 20 1990-025A 20533 B-2 90-03-26 Cs 90-04-18 23:13 UT
II-8 21 21 1990-068A 20724 E-2 90-08-02 Cs 90-08-22 15:00 UT
II-9 15 15 1990-088A 20830 D-2 90-10-01 Cs 90-10-15 00:39 UT

Block IIA
II-10 23 23 1990-103A 20959 E-4 90-11-26 Cs 90-12-10 23:45 UT
II-11 24 24 1991-047A 21552 D-1 91-07-04 Rb 91-08-30 04:44 UT
II-12 25 25 1992-009A 21890 A-2 92-02-23 Cs 92-03-24 11:00 UT
II-13 28 28 1992-019A 21930 C-2 92-04-10 Cs 92-04-25 20:32 UT
II-14 26 26 1992-039A 22014 F-2 92-07-07 Cs 92-07-23 19:43 UT
II-15 27 27 1992-058A 22108 A-3 92-09-09 Cs 92-09-30 20:08 UT
II-16 32 01 1992-079A 22231 F-1 92-11-22 Cs 92-12-11 14:49 UT
II-17 29 29 1992-089A 22275 F-4 92-12-18 Cs 93-01-05 16:39 UT
II-18 22 22 1993-007A 22446 B-1 93-02-03 Cs 93-04-04 05:20 UT
II-19 31 31 1993-017A 22581 C-3 93-03-30 Cs 93-04-13 20:53 UT
II-20 37 07 1993-032A 22657 C-4 93-05-13 Cs 93-06-12 16:15 UT
II-21 39 09 1993-042A 22700 A-1 93-06-26 Cs 93-07-20 12:54 UT
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II-22 35 05 1993-054A 22779 B-4 93-08-30 Cs 93-09-28 19:29 UT
II-23 34 04 1993-068A 22877 D-4 93-10-26 Cs 93-11-22 18:20 UT
II-24 36 06 1994-016A 23027 C-1 94-03-10 Projected usable 94-04-18
38 To be launched on need in FY '94
33 To be launched on need in FY '94
40 To be launched on need in FY '95
30 To be launched on need in FY '95

Notes
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1. NASA Catalog Number is also known as NORAD or U.S. Space Command object number.
2. No orbital plane position = satellite no longer operational.
3. Clock: Rb = Rubidium; Cs = Cesium
4. S/A had been enabled on Block II satellites during part of 1990; S/A off between about 10 August 1990 and 1 July 1991 due to Gulf crisis; standard level re-implemented on 15 November 1991. Currently, PRN15 and PRN20 appear to have little or no S/A imposed.
5. Anti-spoofing was activated on 94-01-31 at 0000 UT on all Block II satellites. (ref. NANU 050-94042)
6. PRN number of SVN32 was changed from 32 to 01 on 93-01-28.
7. PRN03 is operating on Rb clock without temperature control.
8. PRN03 was set unhealthy on 94-02-27 at 0320 UT. It was unusable beginning at 0233 UT on 94-02-27 and will remain unusable until further notice due to "end of life testing." (ref. NANU 057-94059 and NANU 083-94059). It is unlikely that PRN03 will return to service. (ref. USNO)
9. The decommissioning date for PRN06/SVN03 is the date of termination of operations of this satellite (ref. USNO) and is about 3 weeks later than the date GPSIC gives for "deactivation".
10. The PRN06/SVN36 launch included the SEDS-2 tether experiment on the Delta II rocket body (object 23028, 1994-016B).
11. PRN09 was unusable beginning 93-10-15 1200 UT until 93-12-07 1940 UT due to testing. (ref. NANU 327-93288 and NANU 402-93341)
12. The power supply of PRN13 may have insufficient capacity to maintain L1/L2 transmissions during eclipse season. During this period, the L1/L2 transmissions of PRN13 may be turned off for up to 12 hours a day. (ref. NANU 285-92315)
13. The degraded C/A-code performance of PRN19 was corrected effective 94-01-04 at 0000 UT. (ref. NANU 343-93294, NANU 396-93337, and NANU 006-94010)
14. PRN24 was unusable from 94-01-23 1745 UT until 94-02-01 1516 UT due to a change in operational frequency standard from Cs to Rb. (ref. NANU 023-94023, NANU 029-94024, NANU 034-94032, and USNO)

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432. Re: Telecom and Meteors

Newsgroup: rec.radio.amateur.space
Date: 1994-03-23 15:18:20 UTC
From: RLOKER01@IC1D.HARRIS.COM
Message-ID: <19940323101751.RLOKER01@p15jg.ess.harris.com>
Source record: 27686

In Article <1994Mar23.001205.21873@rs6000.cmp.ilstu.edu> "cdfore@rs6000.cmp.ilstu.edu (Curt Fore)" says:
>
> Help!! I'm Looking for info on using meteors to bounce signals for
> telecommunication. I saw a show in January on it. Now I have to write a
> paper on something in telecommunication and as you can see my writing sucks.
Amateur radio operators use this (sometimes). April "QST" magazine has a table of current record-holders using various "modes" of propogation for microwave communications and I think meteor-scatter is one of the ones shown. In any event, meteor-scatter should be covered in the "ARRL HANDBOOK", available in many bookstores (particularly University Bookstores at schools with significant technical orientation).
Other amateur radio magazines that you might look at are probably in your school library, and certainly in any large bookstores around there.
R.C. LOKERSON (BOB) MAIL ADDRESS: VOICE : 407.729.2257
HARRIS MDSO/MIS/DCC/ATG HARRIS E.S.S. SMTP : RLOKER01@IC1D.HARRIS.COM
BLDG 15/RM 838 P.O. BOX 37 CCMAIL: RLOKER01
PALM BAY, FLORIDA MELBOURNE FL FCC : WA3PKX
32902 HOME : 407.725.8024
(I WROTE IT, NOT MR. HARRIS)

"ANY CONCEPT NOT RELATED TO 'FONTS' WHICH CANNOT BE EXPRESSED IN 3 FONTS ... CANNOT BE EXPRESSED IN 3000 FONTS."

433. what does NO -2 N4USH mean?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-24 23:36:27 UTC
From: bmm1@freenet2.scri.fsu.edu
Message-ID: <9403242326.AA24705@freenet3.scri.fsu.edu>
Source record: 27687

I am trying to establish an uplink to UO22 and so far have all I have gotten is the message 'NO -2 N4USH'. What does this mean? Does anyone have any info on what all the information that OSCARS 22, 23 & 25 routinely downlink means? Some is obvious, some is not. I have found some problems and corrected them and am waiting for evening passes to check them out. Any suggestions or comments on debugging uplinks would be appreciated.
thanks, Bruce. N4USH
--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

434. Re: Telecom and Meteors

Newsgroup: rec.radio.amateur.space
Date: 1994-03-25 07:02:29 UTC
From: awoodhull@hamp.hampshire.edu
Message-ID: <2mv5b9$t13@nic.umass.edu>
Source record: 27688

In Article <Cn6yLn.Mz0@ncifcrf.gov> mack@ncifcrf.gov (Joe Mack) writes:

> [Communication via meteors has] never taken off and as far as I can tell it
>'s only being used by experimenters.

I believe I read a few years ago about meteor scatter being used by remotely located unmanned weather stations to relay information to central locations using packet radio techniques. The information is bundled into packets that are small enough and transmitted rapidly enough that an entire packet has a good chance of getting through in its entirety. The packet protocol verifies receipt of packets and causes retransmission of unverified packets until they are successfully received. Since the total volume of information is relatively small the overall data rate is satisfactory.

My recollection is vague, but this could have been an article in the journal Science, and perhaps it was as long ago as the late '70s. I think I recall a color picture of a remote weather station in the arctic on the cover of the issue. I would be pleased if someone could find the reference and send it to me.

I wonder if hams have done work on meteor scatter packet transmission? It would have to be done on clear channels and with very specialized parameters (short packets, unlimited retries, fast response).

On a related topic, I have sometimes noticed when propagation is marginal but not entirely dead on 10 or 15 meters that weak signals will "pop up" briefly and then return to their normal level. I have suspected, but do not know for sure, that this is due to meteor trail reflections.

Albert S. Woodhull N1AW
Hampshire College, Amherst, MA, USA
awoodhull@hamp.hampshire.edu

435. On-line satellite schedules?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-25 07:05:37 UTC
From: awoodhull@hamp.hampshire.edu
Message-ID: <2mv5h4$t13@nic.umass.edu>
Source record: 27689

Is there an on-line source of data about Oscar and RS satellite schedules
of operation?

Albert S. Woodhull
Hampshire College, Amherst, MA, USA
awoodhull@hamp.hampshire.edu

436. Two-Line Orbital Element Sets (TLE366)

Newsgroup: rec.radio.amateur.space
Date: 1994-03-26 16:11:16 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.764698276@afit.af.mil>
Source record: 27690

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.info.
This week's elements are provided below.

```
- Current Two-Line Element Sets #366 -
Alouette 1
1 00424U 62049 94080.20365078 .00000086 00000-0 90645-4 0 9771
2 00424 80.4633 11.8093 0023723 344.6803 15.3621 13.67802591570375
ATS 3
1 03029U 67111A 94080.23310120 -.00000109 00000-0 10000-3 0 1710
2 03029 14.5921 8.3830 0010068 272.9586 235.7439 1.00272806 96558
Cosmos 398
1 04966U 71016A 94083.97764336 .00137788 72168-5 29785-3 0 874
2 04966 51.4477 296.6704 1109571 117.3661 254.4702 13.68625857761120
Starlette
1 07646U 75010A 94080.59487384 -.00000118 00000-0 21579-4 0 7655
2 07646 49.8246 139.0081 0206198 46.8589 314.9345 13.82185765965731
LAGEOS
1 08820U 76039A 94080.57091206 .00000038 00000-0 10000-3 0 9775
2 08820 109.8289 105.5938 0044456 303.5138 56.1322 6.38664355161557
ETS-2
1 09852U 77014A 94070.85048620 -.00000159 00000-0 10000-3 0 9581
2 09852 11.9850 42.6477 0002572 4.2921 155.3539 0.99995589 9681
GOES 2
1 10061U 77048A 94080.22831351 .00000078 00000-0 10000-3 0 3083
2 10061 11.0399 46.7851 0001951 354.2018 83.5862 1.00274708 6235
IUE
1 10637U 78012A 94083.40730808 -.00000181 00000-0 10000-3 0 9859
2 10637 34.4821 96.2945 1311181 33.3317 147.4066 1.00294567 11871
GPS BI-01
1 10684U 78020A 94075.33863500 -.00000014 00000-0 10000-3 0 2598
2 10684 64.5943 48.2717 0063538 163.9849 196.2234 1.98069718103095
GPS BI-02
1 10893U 78047A 94082.45172836 .00000043 00000-0 10000-3 0 549
2 10893 63.5762 287.1719 0213228 13.9136 346.6767 2.01627426116342
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GOES 3
1 10953U 78062A 94079.35186598 .00000076 00000-0 10000-3 0 2850
2 10953 9.9690 49.5175 0004673 108.1221 332.6278 1.00288915 10836
SeaSat 1
1 10967U 78064A 94084.22161053 .00000032 00000-0 55323-4 0 2735
2 10967 108.0049 288.4594 0001383 268.5330 91.5652 14.37938991824296
GPS BI-03
1 11054U 78093A 94080.39449972 .00000044 00000-0 10000-3 0 1675
2 11054 63.2765 284.3367 0043280 175.3817 184.6889 1.93505621112813
Nimbus 7
1 11080U 78098A 94080.60298061 .00000003 00000-0 41350-4 0 3775
2 11080 99.0679 327.4505 0009497 11.6709 348.4657 13.83733252777961
GPS BI-04
1 11141U 78112A 94074.00892174 -.00000024 00000-0 00000+0 0 8683
2 11141 64.5991 49.3811 0048280 24.0304 336.1673 1.92894558 1961
GPS BI-05
1 11690U 80011A 94069.18665568 -.00000017 00000-0 10000-3 0 7654
2 11690 64.9028 50.2893 0151049 184.3059 175.5313 2.00554800117553
GPS BI-06
1 11783U 80032A 94082.47457936 .00000046 00000-0 10000-3 0 9591
2 11783 62.6918 281.1017 0209111 29.2917 331.9050 2.03456672102210
GOES 5
1 12472U 81049A 94080.23389262 .00000099 00000-0 10000-3 0 7578
2 12472 6.6417 59.0977 0005188 348.8352 73.8911 1.00287063 4880
Cosmos 1383
1 13301U 82066A 94080.26605185 .00000036 00000-0 25344-4 0 2752
2 13301 82.9335 14.2180 0027514 340.7905 19.2208 13.68052637585408
LandSat 4
1 13367U 82072A 94082.15715939 .00000233 00000-0 61821-4 0 4627
2 13367 98.1880 142.2091 0007623 153.4744 206.6846 14.57122931621535
IRAS
1 13777U 83004A 94083.53514859 .00000361 00000-0 27903-3 0 5792
2 13777 98.9741 276.2375 0012182 183.6346 176.4733 13.99200191239305
Cosmos 1447
1 13916U 83021A 94080.24653568 .00000019 00000-0 44270-5 0 3765
2 13916 82.9407 76.7416 0036454 275.5808 84.1183 13.74305874551255
TDRS 1
1 13969U 83026B 94083.69950531 -.00000194 00000-0 10000-4 0 2857
2 13969 7.5401 51.9938 0013087 49.4930 57.1911 1.00271512 13209
GOES 6
1 14050U 83041A 94080.24132310 -.00000142 00000-0 10000-3 0 1841
2 14050 5.4185 61.9275 0003496 315.6703 150.8815 1.00219059 11908
OSCAR 10
1 14129U 83058B 94078.88849305 -.00000143 00000-0 10000-3 0 2710
2 14129 27.1881 336.3846 6021341 163.5017 230.9609 2.05878514 52971
LandSat 5
1 14780U 84021A 94083.91201215 .00000109 00000-0 34289-4 0 430
2 14780 98.1726 145.3147 0005116 149.9990 210.1508 14.57128420535200
UoSat 2
1 14781U 84021B 94080.50956311 .00000321 00000-0 62308-4 0 6757
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2 14781 97.7914 99.3260 0011137 186.0140 174.0935 14.69174575537432
GPS BI-09
1 15039U 84059A 94083.97033832 -.00000011 00000-0 10000-3 0 1824
2 15039 63.9235 43.6838 0057348 218.8683 140.7028 2.00559045 71654
Cosmos 1574
1 15055U 84062A 94083.64772592 .00000029 00000-0 14106-4 0 5760
2 15055 82.9554 127.4038 0029365 91.2415 269.2104 13.73602370489022
GPS BI-10
1 15271U 84097A 94079.90233661 .00000042 00000-0 10000-3 0 7812
2 15271 62.3990 281.1869 0144071 348.3745 11.3254 2.00579105 68686
Cosmos 1602
1 15331U 84105A 94080.27031844 .00000683 00000-0 78186-4 0 2670
2 15331 82.5360 160.0441 0021473 129.9179 230.3922 14.84345044511476
NOAA 9
1 15427U 84123A 94081.96146229 .00000121 00000-0 88127-4 0 7596
2 15427 99.0648 131.4010 0015937 101.6666 258.6297 14.13600524478169
GPS BI-11
1 16129U 85093A 94081.64209635 .00000009 00000-0 10000-3 0 5765
2 16129 64.6653 45.8913 0130920 140.6871 220.2666 2.00563899 8423
Mir
1 16609U 86017A 94084.22298912 .00012832 00000-0 17118-3 0 5391
2 16609 51.6456 247.1587 0015513 70.7148 289.5529 15.58361608 493
SPOT 1
1 16613U 86019A 94083.23673708 .00000089 00000-0 62356-4 0 6597
2 16613 98.6963 158.3679 0001148 93.6959 266.4344 14.20050139104508
Cosmos 1766
1 16881U 86055A 94083.84227448 .00000788 00000-0 92844-4 0 1841
2 16881 82.5165 214.7258 0019981 140.2592 220.0087 14.83383263412954
EGP
1 16908U 86061A 94080.21462082 -.00000097 00000-0 00000+0 0 8727
2 16908 50.0125 354.8611 0011625 89.5325 270.6842 12.44409280 14439
NOAA 10
1 16969U 86073A 94082.90887763 .00000064 00000-0 45657-4 0 6589
2 16969 98.5123 94.5094 0012333 216.3165 143.7179 14.24874536390466
MOS-1
1 17527U 87018A 94082.19666578 .00000091 00000-0 99794-4 0 529
2 17527 99.0409 152.6620 0001193 90.5395 269.5903 13.94900139360958
GOES 7
1 17561U 87022A 94083.40485191 -.00000053 00000-0 10000-3 0 7840
2 17561 1.3689 76.7570 0003890 329.3032 168.8873 1.00272080 9126
Kvant-1
1 17845U 87030A 94083.00453908 .00016104 00000-0 21329-3 0 7930
2 17845 51.6456 253.2710 0015263 66.8993 293.2682 15.58334736462832
DMSP B5D2-3
1 18123U 87053A 94081.90669245 .00000080 00000-0 63336-4 0 3796
2 18123 98.7903 274.8761 0015291 66.9559 293.3228 14.15344183348802
RS-10/11
1 18129U 87054A 94083.85950758 .00000045 00000-0 32996-4 0 8841
2 18129 82.9237 31.1672 0010089 260.3947 99.6072 13.72333660338341
Meteor 2-16
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1 18312U 87068A 94080.03226527 .00000051 00000-0 32248-4 0 2736
2 18312 82.5518 281.7765 0013002 6.3192 353.8129 13.84025791332862
Meteor 2-17
1 18820U 88005A 94080.22884509 .00000094 00000-0 70460-4 0 2738
2 18820 82.5454 338.5623 0018465 67.8592 292.4524 13.84711844310182
DMSP B5D2-4
1 18822U 88006A 94077.00244064 .00000113 00000-0 68932-4 0 4723
2 18822 98.4542 295.6905 0005346 252.8359 107.2243 14.22936940317553
Glonass 34
1 19163U 88043A 94080.19921755 .00000065 00000-0 10000-3 0 8751
2 19163 65.0092 113.3774 0008307 166.7743 193.3259 2.13102548 44783
Glonass 36
1 19165U 88043C 94081.19358379 .00000076 00000-0 10000-3 0 2701
2 19165 64.9951 113.3343 0004465 329.4555 30.6048 2.13101967 45424
METEOSAT 3
1 19215U 88051A 94082.06953944 -.00000259 00000-0 10000-3 0 8836
2 19215 1.5396 73.0004 0002905 283.8226 133.5086 1.00257742 9053
AO-13
1 19216U 88051B 94079.56167208 -.00000427 00000-0 10000-4 0 8960
2 19216 57.8735 262.2374 7209738 337.3974 2.4979 2.09727288 12654
OKEAN 1
1 19274U 88056A 94082.06062051 .00000438 00000-0 52043-4 0 8849
2 19274 82.5148 316.2430 0018878 298.1611 61.7699 14.82134561308321
Meteor 3-2
1 19336U 88064A 94081.32685617 .00000051 00000-0 10000-3 0 2700
2 19336 82.5427 25.1440 0017958 116.8969 243.3993 13.16965967271824
Glonass 39
1 19503U 88085C 94083.09595125 -.00000051 00000-0 10000-3 0 1664
2 19503 65.7463 352.2022 0004928 179.6295 180.3932 2.13102231 42950
NOAA 11
1 19531U 88089A 94083.23885812 .00000062 00000-0 58133-4 0 5722
2 19531 99.1670 70.0925 0012545 15.7107 344.4450 14.12969487283226
TDRS 2
1 19548U 88091B 94076.22605189 -.00000289 00000-0 10000-3 0 8973
2 19548 0.8131 78.3475 0002303 270.7535 204.9243 1.00275984 7280
Glonass 40
1 19749U 89001A 94081.25855224 .00000076 00000-0 10000-3 0 3781
2 19749 64.9513 112.9385 0007046 261.9497 98.0454 2.13101344 40423
Glonass 41
1 19750U 89001B 94083.19218186 .00000091 00000-0 10000-3 0 2661
2 19750 64.9642 112.9453 0007173 275.7493 84.2103 2.13102379 40487
GPS BII-01
1 19802U 89013A 94083.46592835 .00000043 00000-0 10000-3 0 8795
2 19802 55.1504 143.0928 0033802 178.7991 181.2887 2.00576579 37351
Akebono
1 19822U 89016A 94081.88027399 .00012404 00000-0 60658-3 0 2301
2 19822 75.0816 231.1885 3832673 354.0676 2.4860 7.76692756102583
Meteor 2-18
1 19851U 89018A 94080.40680956 .00000034 00000-0 17134-4 0 2720
2 19851 82.5191 213.8899 0015509 110.5826 249.6996 13.84358994255545
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MOP-1
1 19876U 89020B 94082.05681134 -.00000118 00000-0 00000+0 0 93
2 19876 0.2355 46.6550 0262016 295.1624 148.0923 0.96348100 211
TDRS 3
1 19883U 89021B 94081.11127576 -.00000274 00000-0 00000+0 0 8915
2 19883 0.0660 64.0561 0003054 121.8929 352.4186 1.00267512 88592
GPS BII-02
1 20061U 89044A 94083.31289519 -.00000033 00000-0 10000-3 0 9032
2 20061 54.6905 319.9092 0126910 207.0900 152.2823 2.00565922 35091
Nadezhda 1
1 20103U 89050A 94079.81177630 .00000057 00000-0 43816-4 0 9752
2 20103 82.9608 352.9331 0037050 173.5489 186.6148 13.73834471236173
GPS BII-03
1 20185U 89064A 94074.17854113 .00000012 00000-0 10000-3 0 8847
2 20185 54.9179 144.0805 0009947 253.8384 106.1187 2.00577472 33483
GMS 4
1 20217U 89070A 94074.74108910 -.00000290 00000-0 10000-3 0 9974
2 20217 0.0530 351.8329 0000802 99.3024 128.8377 1.00265314 17152
GPS BII-04
1 20302U 89085A 94084.18050011 .00000010 00000-0 10000-3 0 8992
2 20302 53.6289 260.2353 0001834 291.5932 68.3817 2.00563094 32489
Meteor 3-3
1 20305U 89086A 94082.55451529 .00000044 00000-0 10000-3 0 61
2 20305 82.5548 329.1930 0006520 134.5372 225.6269 13.04425118211734
COBE
1 20322U 89089A 94081.08421008 -.00000120 00000-0 -48723-4 0 9889
2 20322 98.9824 98.3518 0009516 147.8461 212.3286 14.03433365222177
Kvant-2
1 20335U 89093A 94083.00453908 .00016104 00000-0 21329-3 0 8738
2 20335 51.6456 253.2710 0015263 66.8993 293.2682 15.58334736462751
GPS BII-05
1 20361U 89097A 94082.69160514 .00000057 00000-0 10000-3 0 7815
2 20361 55.4850 85.6858 0070221 107.0121 253.8008 2.00559722 21938
SPOT 2
1 20436U 90005A 94083.83982106 .00000095 00000-0 65161-4 0 7692
2 20436 98.7241 159.5039 0001202 81.9056 278.2257 14.20029202216121
UO-14
1 20437U 90005B 94081.17271111 .00000085 00000-0 50080-4 0 9757
2 20437 98.5928 167.1239 0011938 85.5805 274.6738 14.29832075217155
UO-15
1 20438U 90005C 94081.20842902 .00000035 00000-0 30804-4 0 7759
2 20438 98.5932 166.2307 0010950 87.7999 272.4441 14.29168653217081
PACSAT
1 20439U 90005D 94080.46187457 .00000059 00000-0 39719-4 0 7754
2 20439 98.5999 167.5628 0012341 89.1267 271.1308 14.29886627217069
DO-17
1 20440U 90005E 94080.42475274 .00000076 00000-0 46272-4 0 7749
2 20440 98.5973 167.8190 0012406 88.5722 271.6879 14.30025717217077
WO-18
1 20441U 90005F 94081.23816758 .00000086 00000-0 50302-4 0 7768
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2 20441 98.6015 168.6325 0013015 86.3234 273.9433 14.30001255217191
LO-19
1 20442U 90005G 94080.24263321 .00000078 00000-0 46967-4 0 7742
2 20442 98.6015 167.8834 0013223 87.9281 272.3415 14.30095566217065
GPS BII-06
1 20452U 90008A 94082.59451445 -.00000011 00000-0 10000-3 0 8840
2 20452 54.0535 200.0054 0053605 74.5343 286.0381 2.00572936 30435
MOS-1B
1 20478U 90013A 94081.66804321 .00000091 00000-0 10000-3 0 6010
2 20478 99.0428 156.2678 0000600 113.2282 246.8943 13.94901756130583
DEBUT
1 20479U 90013B 94080.45108035 -.00000025 00000-0 13866-4 0 7716
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2 20510 82.5207 265.8738 0020077 111.0933 249.2428 14.78288445218774
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2 20523 0.0069 180.6332 0001411 217.4770 122.7808 1.00267933 7744
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2 20546 94.1125 249.9718 0074541 261.5401 97.7402 15.37645450219158
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2 20608 89.9298 180.3763 0108775 39.2158 321.6869 14.64679391206415
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2 20635 51.6456 253.2710 0015263 66.8993 293.2682 15.58334736462721
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2 21006 64.9352 112.2641 0059596 188.6119 171.3585 2.13102970 25614
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2 21007 64.9570 112.3783 0036278 182.9410 177.1081 2.13101208 25571
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2 21216 65.1010 351.6196 0009380 210.5047 149.4766 2.13103450 23143
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2 21217 65.0802 351.7308 0010743 242.3705 117.5351 2.13101985 23076
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2 21987 28.4315 270.8363 0010293 113.9518 246.2151 15.18331057 99311
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1 22012U 92038A 94080.50684673 .00000507 00000-0 42806-4 0 5003
2 22012 81.6685 263.3545 0119087 326.4383 32.9292 14.90886454 93217
GPS BIIA-14
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2 22014 54.9017 201.1425 0083701 297.7544 61.3770 2.00565801 6039
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1 22056U 92047A 94081.56701790 -.00000055 00000-0 00000+0 0 8320
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2 22057 64.9480 351.9215 0008811 323.9781 35.9855 2.13102313 12730
Glonass 58
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NOAA 13
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UFO F2
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KO-25
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Meteor 3-6
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437. AMSAT-085 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-03-28 02:44:50 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-085.01.1994@ampr.org>
Source record: 27691
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-085.01
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 085.05 FROM AMSAT HQ
SILVER SPRING, MD MARCH 26, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-085.01

Weekly OSCAR Status Reports: 26-MAR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Mar 19-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 235/0, Apr 04 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
23-Mar-94 7:52 -to- 30-Mar-94 8:15 UTC
6-Apr-94 6:45 -to- 13-Apr-94 7:10 UTC
20-Apr-94 7:35 -to- 27-Apr-94 7:55 UTC
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

MIR: The packet call for MIR is R0MIR-1 and the operating frequency is
145.550 MHz. The crew usually has the Personal Messaging System
(PMS) running. If you hear voice operations ask for Victor, Yuri, or
Valeri. [VK3DFI]

AO-27: AMRAD-OSCAR-27 (AO-27) is up and going, and is said to be working
well. It is in popular use in Europe. The 436.800 MHz FM down-
link can be heard on a hand-held. Uplink is 145.850 MHz. It is
said to be only active in daylight passes. [G3IOR]

UFO: We have a UFO on 145.592 MHz sending data. It was first heard by
G3JQI at 18:50 UTC "dopplering" down until 18:55 UTC LOS on
16-MAR-94. [G3IOR]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

438. Re: Ham-Space Digest V94 #72

Newsgroup: rec.radio.amateur.space
Date: 1994-03-28 03:56:34 UTC
From: u3611506@abac.AU.ac.TH
Message-ID: <Pine.3.89.9403272049.A3004-0100000@abac>
Source record: 27692

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-=-=-=-= From the desk of ...=-=-=-=--=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
/--------------------------=* Jade V. Thaveekij, HS1ZEB N3JTV *=----.
| Internet: u3611506@abac.au.ac.th jadev@morakot.nectec.or.th O
| E-Mail : War On Virus BBS, U'NI-Net, Wild-Net & ThaiNetwork Conf O
.oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooO
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On Sun, 27 Mar 1994, Ham-Space Mailing List and Newsgroup wrote:

>
> MAIL DELETED BECAUSE OF LACK OF DISK SPACE
>
>

The lastest digest sent to me contained only the above line. Is it from
my own limitation or the site? I don't think we compose any limits on
this system

439. telecom and meteors

Newsgroup: rec.radio.amateur.space
Date: 1994-03-28 07:05:26 UTC
From: ttrent@oregon.uoregon.edu
Message-ID: <2n5vjm$lsf@pith.uoregon.edu>
Source record: 27693

Some of the messages about meteor-burst type communication posted are not quite correct. I have done quite a bit of meteor-burst communication on two meters and one does not need 12 to 24 hours to complete a contact. An excellent starting point for information on amateur radio experimentation in "this area is the ARRL book called something like "Beyond Line of Sight". There are alot of articles about maximizing success during showers. I have had good results scheduling stations in the 900-1200 mile range. This pre-arrangement is usually done on 75 meters, 3818 and 3843, before and during the showers. I have made good two-way contacts in as little as one or two minutes, and have also heard nothing for an entire half hour of schedules. During any shower there is usually a peak when one can get on and call short CQ's and raise people, especially if one stays off 144.2. I have had about ten people call at once at times. This effect is also noticeable on 10, 15, 20 and 6 meters, anywhere where the signal is lower than the burst that it may recieve from the meteor enhancement. There is also some software available for predicting when the peaks in the showers will correspond to your qth, please e-mail me if you are interested.

q
73
Tom Trent
ttrent@oregon.uoregon.edu

440. Re: On-line satellite schedules?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-28 23:36:34 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <CnEEwy.Kpy@freenet.carleton.ca>
Source record: 27694

In a previous article, awoodhull@hamp.hampshire.edu () says:

>Is there an on-line source of data about Oscar and RS satellite schedules
>of operation?
>
> Albert S. Woodhull
> Hampshire College, Amherst, MA, USA
> awoodhull@hamp.hampshire.edu
>
Let me know if you find one.
Thanks,Herb
>

441. APT and Game ports.

Newsgroup: rec.radio.amateur.space
Date: 1994-03-28 23:58:11 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <CnEFwz.Lqw@freenet.carleton.ca>
Source record: 27695

I would like to use the ADC on the game port(joystick port) to digitize processed (ie filter and other needed things) APT output with my old humble 386.Any known pitfalls or no no's??

442. MIR hard to reach these days?

Newsgroup: rec.radio.amateur.space
Date: 1994-03-29 19:12:25 UTC
From: Greg <laborde@elm.jpl.nasa.gov>
Message-ID: <2n9uip$did@elroy.jpl.nasa.gov>
Source record: 27696

Is Mir's packet station on these days? I have been using InstanTrack and getting the latest Keps from archive.mil, but I have not had any response for about the last 10 days. One night I even went outside and caught a visual sighting, so I know that I am tracking it OK.

Another disturbing fact is that I don't see anyone ELSE trying for Mir. What do they know that I don't?

-Gregory LaBorde
Los Angeles

443. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 04:00:13 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_765086411@ve6mgs.ampr.org>
Source record: 27697
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

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Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
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a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

--
Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

444. orbs$091.oscar.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 17:55:26 UTC
From: ray.hoad@pubcon.com
Message-ID: <9403312301203@pubcon.com>
Source record: 27698

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SB KEPS @ AMSAT $ORBS-091.O
Orbital Elements 091.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94090.04857020
Element set: 272
Inclination: 27.1828 deg
RA of node: 334.6164 deg
Eccentricity: 0.6021586
Arg of perigee: 166.4731 deg
Mean anomaly: 222.3171 deg
Mean motion: 2.05878019 rev/day
Decay rate: -1.26e-06 rev/day^2
Epoch rev: 8117
Checksum: 283

Satellite: UO-11
Catalog number: 14781
Epoch time: 94088.54614116
Element set: 677
Inclination: 97.7907 deg
RA of node: 106.9891 deg
Eccentricity: 0.0011724
Arg of perigee: 159.5745 deg
Mean anomaly: 200.5932 deg
Mean motion: 14.69179967 rev/day
Decay rate: 3.10e-06 rev/day^2
Epoch rev: 53861
Checksum: 341

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94087.86953292
Element set: 885
Inclination: 82.9247 deg
RA of node: 28.2040 deg
Eccentricity: 0.0010048
Arg of perigee: 247.5026 deg
Mean anomaly: 112.5060 deg
```

Mean motion: 13.72333957 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 33889
Checksum: 316

Satellite: AO-13
Catalog number: 19216
Epoch time: 94089.57476926
Element set: 897
Inclination: 57.8673 deg
RA of node: 260.4952 deg
Eccentricity: 0.7210521
Arg of perigee: 338.0957 deg
Mean anomaly: 2.2906 deg
Mean motion: 2.09726187 rev/day
Decay rate: -4.05e-06 rev/day^2
Epoch rev: 4436
Checksum: 338

Satellite: FO-20
Catalog number: 20480
Epoch time: 94089.46791516
Element set: 672
Inclination: 99.0274 deg
RA of node: 256.2045 deg
Eccentricity: 0.0541263
Arg of perigee: 157.7469 deg
Mean anomaly: 204.8111 deg
Mean motion: 12.83224806 rev/day
Decay rate: -2.6e-07 rev/day^2
Epoch rev: 19403
Checksum: 305

Satellite: AO-21
Catalog number: 21087
Epoch time: 94087.23338553
Element set: 448
Inclination: 82.9383 deg
RA of node: 202.5987 deg
Eccentricity: 0.0035057
Arg of perigee: 312.0281 deg
Mean anomaly: 47.7812 deg
Mean motion: 13.74536472 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 15846
Checksum: 318

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94087.91832396
Element set: 675

Inclination: 82.9180 deg
RA of node: 70.9759 deg
Eccentricity: 0.0029421
Arg of perigee: 335.5442 deg
Mean anomaly: 24.4319 deg
Mean motion: 13.74038100 rev/day
Decay rate: 7.3e-07 rev/day^2
Epoch rev: 15762
Checksum: 315

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94089.09349977
Element set: 248
Inclination: 1.5156 deg
RA of node: 104.5135 deg
Eccentricity: 0.2923641
Arg of perigee: 175.5080 deg
Mean anomaly: 188.1427 deg
Mean motion: 1.42202601 rev/day
Decay rate: -1.05e-06 rev/day^2
Epoch rev: 7
Checksum: 273

/EX

445. orbs$091.micro.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 17:57:26 UTC
From: ray.hoad@pubcon.com
Message-ID: <9403312301204@pubcon.com>
Source record: 27699

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SB KEPS @ AMSAT $ORBS-091.D
Orbital Elements 091.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94089.78002368
Element set: 977
Inclination: 98.5902 deg
RA of node: 175.6151 deg
Eccentricity: 0.0011994
Arg of perigee: 63.2614 deg
Mean anomaly: 296.9794 deg
Mean motion: 14.29833748 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 21838
Checksum: 351

Satellite: AO-16
Catalog number: 20439
Epoch time: 94089.20880979
Element set: 777
Inclination: 98.6002 deg
RA of node: 176.2024 deg
Eccentricity: 0.0012329
Arg of perigee: 65.1942 deg
Mean anomaly: 295.0533 deg
Mean motion: 14.29888159 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 21831
Checksum: 325

Satellite: DO-17
Catalog number: 20440
Epoch time: 94089.24080620
Element set: 776
Inclination: 98.5996 deg
RA of node: 176.5305 deg
Eccentricity: 0.0012438
Arg of perigee: 64.3153 deg
Mean anomaly: 295.9310 deg
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Mean motion: 14.30027317 rev/day
Decay rate: 6.3e-07 rev/day^2
Epoch rev: 21833
Checksum: 297

Satellite: WO-18
Catalog number: 20441
Epoch time: 94090.19431294
Element set: 778
Inclination: 98.6012 deg
RA of node: 177.4806 deg
Eccentricity: 0.0013046
Arg of perigee: 61.5324 deg
Mean anomaly: 298.7177 deg
Mean motion: 14.30002526 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 21847
Checksum: 294

Satellite: LO-19
Catalog number: 20442
Epoch time: 94089.26815097
Element set: 776
Inclination: 98.6013 deg
RA of node: 176.8020 deg
Eccentricity: 0.0013338
Arg of perigee: 63.8292 deg
Mean anomaly: 296.4260 deg
Mean motion: 14.30097329 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21835
Checksum: 312

Satellite: UO-22
Catalog number: 21575
Epoch time: 94088.19621400
Element set: 478
Inclination: 98.4399 deg
RA of node: 164.2896 deg
Eccentricity: 0.0007602
Arg of perigee: 162.2933 deg
Mean anomaly: 197.8526 deg
Mean motion: 14.36902851 rev/day
Decay rate: 8.2e-07 rev/day^2
Epoch rev: 14159
Checksum: 332

Satellite: KO-23
Catalog number: 22077
Epoch time: 94089.40023487
Element set: 373

Inclination: 66.0807 deg
RA of node: 84.9415 deg
Eccentricity: 0.0012132
Arg of perigee: 306.9711 deg
Mean anomaly: 53.0198 deg
Mean motion: 12.86285590 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7665
Checksum: 306

Satellite: AO-27
Catalog number: 22825
Epoch time: 94090.23004933
Element set: 274
Inclination: 98.6599 deg
RA of node: 166.8062 deg
Eccentricity: 0.0009628
Arg of perigee: 75.4070 deg
Mean anomaly: 284.8171 deg
Mean motion: 14.27615820 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 2656
Checksum: 317

Satellite: IO-26
Catalog number: 22826
Epoch time: 94090.21670618
Element set: 274
Inclination: 98.6600 deg
RA of node: 166.8192 deg
Eccentricity: 0.0010132
Arg of perigee: 76.2498 deg
Mean anomaly: 283.9812 deg
Mean motion: 14.27718516 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 2656
Checksum: 309

Satellite: KO-25
Catalog number: 22830
Epoch time: 94089.19391177
Element set: 277
Inclination: 98.5601 deg
RA of node: 163.8935 deg
Eccentricity: 0.0012606
Arg of perigee: 49.5068 deg
Mean anomaly: 310.7222 deg
Mean motion: 14.28043381 rev/day
Decay rate: 6.1e-07 rev/day^2
Epoch rev: 2642
Checksum: 300

/EX

446. orbs$091.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 18:00:42 UTC
From: ray.hoad@pubcon.com
Message-ID: <9403312301205@pubcon.com>
Source record: 27700

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SB KEPS @ AMSAT $ORBS-091.W
Orbital Elements 091.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94081.96146229
Element set: 759
Inclination: 99.0648 deg
RA of node: 131.4010 deg
Eccentricity: 0.0015937
Arg of perigee: 101.6666 deg
Mean anomaly: 258.6297 deg
Mean motion: 14.13600524 rev/day
Decay rate: 1.21e-06 rev/day^2
Epoch rev: 47816
Checksum: 312

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94082.90887763
Element set: 658
Inclination: 98.5123 deg
RA of node: 94.5094 deg
Eccentricity: 0.0012333
Arg of perigee: 216.3165 deg
Mean anomaly: 143.7179 deg
Mean motion: 14.24874536 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 39046
Checksum: 336

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94089.18881615
Element set: 275
Inclination: 82.5443 deg
RA of node: 331.4359 deg
Eccentricity: 0.0018219
Arg of perigee: 45.0857 deg
Mean anomaly: 315.1779 deg
```

Mean motion: 13.84712261 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 31142
Checksum: 311

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94089.83574800
Element set: 272
Inclination: 82.5443 deg
RA of node: 19.1260 deg
Eccentricity: 0.0018339
Arg of perigee: 97.2779 deg
Mean anomaly: 263.0433 deg
Mean motion: 13.16965918 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27294
Checksum: 324

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94083.23885812
Element set: 572
Inclination: 99.1670 deg
RA of node: 70.0925 deg
Eccentricity: 0.0012545
Arg of perigee: 15.7107 deg
Mean anomaly: 344.4450 deg
Mean motion: 14.12969487 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 28322
Checksum: 300

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94089.36906685
Element set: 274
Inclination: 82.5194 deg
RA of node: 206.7454 deg
Eccentricity: 0.0015814
Arg of perigee: 87.7360 deg
Mean anomaly: 272.5605 deg
Mean motion: 13.84360092 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 25678
Checksum: 341

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94090.37821933
Element set: 14

Inclination: 82.5542 deg
RA of node: 323.7875 deg
Eccentricity: 0.0006847
Arg of perigee: 112.9105 deg
Mean anomaly: 247.2662 deg
Mean motion: 13.04412938 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21275
Checksum: 284

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94088.50123196
Element set: 776
Inclination: 82.5419 deg
RA of node: 271.7609 deg
Eccentricity: 0.0017267
Arg of perigee: 14.3017 deg
Mean anomaly: 345.8619 deg
Mean motion: 13.84189951 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18959
Checksum: 337

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94090.21888621
Element set: 930
Inclination: 98.8335 deg
RA of node: 112.8405 deg
Eccentricity: 0.0013476
Arg of perigee: 222.0473 deg
Mean anomaly: 137.9657 deg
Mean motion: 14.01311217 rev/day
Decay rate: -5.2e-07 rev/day^2
Epoch rev: 18278
Checksum: 300

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94089.84563327
Element set: 785
Inclination: 82.5242 deg
RA of node: 208.2980 deg
Eccentricity: 0.0011952
Arg of perigee: 268.4342 deg
Mean anomaly: 91.5449 deg
Mean motion: 13.83575783 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 17692
Checksum: 340

Satellite: MET-3/4
Catalog number: 21232

447. orbs$091.misc.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 18:02:21 UTC
From: ray.hoad@pubcon.com
Message-ID: <9403312301206@pubcon.com>
Source record: 27701

```
SB KEPS @ AMSAT $ORBS-091.M
Orbital Elements 091.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94089.68812903
Element set: 267
Inclination: 98.6555 deg
RA of node: 166.3095 deg
Eccentricity: 0.0011064
Arg of perigee: 65.4928 deg
Mean anomaly: 294.7409 deg
Mean motion: 14.28014942 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 2649
Checksum: 332

Satellite: MIR
Catalog number: 16609
Epoch time: 94090.25081547
Element set: 549
Inclination: 51.6462 deg
RA of node: 216.9197 deg
Eccentricity: 0.0015558
Arg of perigee: 91.3363 deg
Mean anomaly: 268.9434 deg
Mean motion: 15.58441517 rev/day
Decay rate: 8.348e-05 rev/day^2
Epoch rev: 49380
Checksum: 334

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94089.87951733
Element set: 462
Inclination: 28.4691 deg
RA of node: 18.9736 deg
Eccentricity: 0.0006088
Arg of perigee: 352.0216 deg
Mean anomaly: 8.0277 deg
```

Mean motion: 14.90551165 rev/day
Decay rate: 1.063e-05 rev/day^2
Epoch rev: 1769
Checksum: 307

Satellite: GRO
Catalog number: 21225
Epoch time: 94087.37564364
Element set: 77
Inclination: 28.4619 deg
RA of node: 72.9760 deg
Eccentricity: 0.0003357
Arg of perigee: 25.2579 deg
Mean anomaly: 334.8185 deg
Mean motion: 15.40487736 rev/day
Decay rate: 4.639e-05 rev/day^2
Epoch rev: 4446
Checksum: 326

Satellite: UARS
Catalog number: 21701
Epoch time: 94088.55112080
Element set: 498
Inclination: 56.9828 deg
RA of node: 118.1810 deg
Eccentricity: 0.0004332
Arg of perigee: 96.2144 deg
Mean anomaly: 263.9383 deg
Mean motion: 14.96463997 rev/day
Decay rate: -2.513e-05 rev/day^2
Epoch rev: 13901
Checksum: 305

/EX

448. orbs$091.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 18:04:07 UTC
From: ray.hoad@pubcon.com
Message-ID: <9403312301207@pubcon.com>
Source record: 27702

```
SB KEPS @ AMSAT $ORBS-091.N
2Line Orbital Elements 091.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94090.04857020 -.00000126 00000-0 10000-3 0 2727
2 14129 27.1828 334.6164 6021586 166.4731 222.3171 2.05878019 81175
UO-11
1 14781U 84021B 94088.54614116 .00000310 00000-0 60435-4 0 6772
2 14781 97.7907 106.9891 0011724 159.5745 200.5932 14.69179967538610
RS-10/11
1 18129U 87054A 94087.86953292 .00000048 00000-0 35789-4 0 8859
2 18129 82.9247 28.2040 0010048 247.5026 112.5060 13.72333957338899
AO-13
1 19216U 88051B 94089.57476926 -.00000405 00000-0 10000-4 0 8979
2 19216 57.8673 260.4952 7210521 338.0957 2.2906 2.09726187 44366
FO-20
1 20480U 90013C 94089.46791516 -.00000026 00000-0 82466-5 0 6724
2 20480 99.0274 256.2045 0541263 157.7469 204.8111 12.83224806194031
AO-21
1 21087U 91006A 94087.23338553 .00000093 00000-0 82657-4 0 4487
2 21087 82.9383 202.5987 0035057 312.0281 47.7812 13.74536472158468
RS-12/13
1 21089U 91007A 94087.91832396 .00000073 00000-0 62203-4 0 6754
2 21089 82.9180 70.9759 0029421 335.5442 24.4319 13.74038100157622
ARSENE
1 22654U 93031B 94089.09349977 -.00000105 00000-0 00000 0 0 2486
2 22654 1.5156 104.5135 2923641 175.5080 188.1427 1.42202601 77
UO-14
1 20437U 90005B 94089.78002368 .00000055 00000-0 38442-4 0 9775
2 20437 98.5902 175.6151 0011994 63.2614 296.9794 14.29833748218380
AO-16
1 20439U 90005D 94089.20880979 .00000052 00000-0 37099-4 0 7778
2 20439 98.6002 176.2024 0012329 65.1942 295.0533 14.29888159218318
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DO-17
1 20440U 90005E 94089.24080620 .00000063 00000-0 41255-4 0 7769
2 20440 98.5996 176.5305 0012438 64.3153 295.9310 14.30027317218339
WO-18
1 20441U 90005F 94090.19431294 .00000051 00000-0 36697-4 0 7786
2 20441 98.6012 177.4806 0013046 61.5324 298.7177 14.30002526218473
LO-19
1 20442U 90005G 94089.26815097 .00000060 00000-0 40132-4 0 7767
2 20442 98.6013 176.8020 0013338 63.8292 296.4260 14.30097329218359
UO-22
1 21575U 91050B 94088.19621400 .00000082 00000-0 42436-4 0 4782
2 21575 98.4399 164.2896 0007602 162.2933 197.8526 14.36902851141598
KO-23
1 22077U 92052B 94089.40023487 -.00000037 00000-0 10000-3 0 3735
2 22077 66.0807 84.9415 0012132 306.9711 53.0198 12.86285590 76650
AO-27
1 22825U 93061C 94090.23004933 .00000064 00000-0 43978-4 0 2745
2 22825 98.6599 166.8062 0009628 75.4070 284.8171 14.27615820 26560
IO-26
1 22826U 93061D 94090.21670618 .00000050 00000-0 37923-4 0 2741
2 22826 98.6600 166.8192 0010132 76.2498 283.9812 14.27718516 26561
KO-25
1 22830U 93061H 94089.19391177 .00000061 00000-0 41952-4 0 2773
2 22830 98.5601 163.8935 0012606 49.5068 310.7222 14.28043381 26423
NOAA-9
1 15427U 84123A 94081.96146229 .00000121 00000-0 88127-4 0 7596
2 15427 99.0648 131.4010 0015937 101.6666 258.6297 14.13600524478169
NOAA-10
1 16969U 86073A 94082.90887763 .00000064 00000-0 45657-4 0 6589
2 16969 98.5123 94.5094 0012333 216.3165 143.7179 14.24874536390466
MET-2/17
1 18820U 88005A 94089.18881615 .00000060 00000-0 40354-4 0 2751
2 18820 82.5443 331.4359 0018219 45.0857 315.1779 13.84712261311424
MET-3/2
1 19336U 88064A 94089.83574800 .00000051 00000-0 10000-3 0 2727
2 19336 82.5443 19.1260 0018339 97.2779 263.0433 13.16965918272948
NOAA-11
1 19531U 88089A 94083.23885812 .00000062 00000-0 58133-4 0 5722
2 19531 99.1670 70.0925 0012545 15.7107 344.4450 14.12969487283226
MET-2/18
1 19851U 89018A 94089.36906685 .00000056 00000-0 36961-4 0 2749
2 19851 82.5194 206.7454 0015814 87.7360 272.5605 13.84360092256784
MET-3/3
1 20305U 89086A 94090.37821933 .00000044 00000-0 10000-3 0 149
2 20305 82.5542 323.7875 0006847 112.9105 247.2662 13.04412938212758
MET-2/19
1 20670U 90057A 94088.50123196 .00000024 00000-0 79036-5 0 7761
2 20670 82.5419 271.7609 0017267 14.3017 345.8619 13.84189951189594
FY-1/2
1 20788U 90081A 94090.21888621 -.00000052 00000-0 -61897-5 0 9301
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2 20788 98.8335 112.8405 0013476 222.0473 137.9657 14.01311217182780
MET-2/20
1 20826U 90086A 94089.84563327 .00000049 00000-0 31369-4 0 7851
2 20826 82.5242 208.2980 0011952 268.4342 91.5449 13.83575783176926
MET-3/4
1 21232U 91030A 94089.43280640 .00000051 00000-0 10000-3 0 6830
2 21232 82.5388 225.2547 0014229 26.7101 333.4745 13.16460745140997
NOAA-12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
MET-3/5
1 21655U 91056A 94088.27818630 .00000051 00000-0 10000-3 0 6902
2 21655 82.5574 173.1754 0014560 41.6370 318.5859 13.16828652125949
MET-2/21
1 22782U 93055A 94089.43710956 .00000034 00000-0 16948-4 0 2855
2 22782 82.5458 268.8400 0023835 84.7709 275.6182 13.83003171 29200
POSAT
1 22829U 93061G 94089.68812903 .00000066 00000-0 44108-4 0 2670
2 22829 98.6555 166.3095 0011064 65.4928 294.7409 14.28014942 26490
MIR
1 16609U 86017A 94090.25081547 .00008348 00000-0 11343-3 0 5497
2 16609 51.6462 216.9197 0015558 91.3363 268.9434 15.58441517493803
HUBBLE
1 20580U 90037B 94089.87951733 .00001063 00000-0 91113-4 0 4621
2 20580 28.4691 18.9736 0006088 352.0216 8.0277 14.90551165 17696
GRO
1 21225U 91027B 94087.37564364 .00004639 00000-0 10470-3 0 771
2 21225 28.4619 72.9760 0003357 25.2579 334.8185 15.40487736 44468
UARS
1 21701U 91063B 94088.55112080 -.00002513 00000-0 -19868-3 0 4983
2 21701 56.9828 118.1810 0004332 96.2144 263.9383 14.96463997139015
/EX
```

449. Keplerian Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-03-31 18:25:08 UTC
From: ray.hoad@pubcon.com
Message-ID: <9403312301219@pubcon.com>
Source record: 27703

I just uploaded a fresh set of keps for 04/01/94 in this conference.
The files are AMSATKEP.ZIP (AMSAT format) and NASAKEP.ZIP (NASA 2-line).
73 Ray.

450. Important AMSAT-UK News

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 02:47:02 UTC
From: eac@world.std.com
Message-ID: <CnK7qF.Jvn@world.std.com>
Source record: 27815

Satellite News 01APR94
Embargoed for automatic release at 0001 utc 01Apr94

** Phase-3D **
First of all the good news. The recent Ariane-4 crash will not affect the Ariane-5 system so the P3D launch is still on time. The bad news is that ESA have changed the launcher to payload interface yet again. The new system has the payloads metallically bonded together in order to achieve a more rigid structure; there was a latent wobble in the previous method of bolting the spacecraft to the rocket which led to several launches almost being destroyed. The new separation mechanism is designed around un-peeling the bond before firing the explosive bolts. The bond is similar to that found on some tins of fish products (and corned beef). ESA, mindful that their last change cost us considerable funds, have offered to lend us a tin-opener key for the flight.

Amsat-UK news of 01APR89 announced anti-alligator measures on future birds: "When spacecraft software detects a station running QRO, an extendible boom will deploy and cut the guy's co-ax." The boom of "CROCODILE" (Configurable Resource in Orbit Cutting Off Dumb Idiots Liable to Excess) used a radical metallurgical method to remove most boom material. The trouble with CROCODILE was that the guy just had to replace his co-ax and he was back, so it has been scrapped (anyone want an invisible pole 15,000km long ?) in favour of LEILA (Low Earth-orbit Insertion of Linear Amplifiers) which confiscates the guys amplifier and places it into an orbit with a mean altitude of 150km; its not stealing because the guy will be told exactly where his property is and can then retrieve it if he wishes (like having your car towed away for a parking offence).

Quote from Amsat-UK news of 01APR92:
"New on-board propulsion motors will, instead of ammonia, be fuelled by a blend based on the fermentation of baked beans, fried onions, guinness, and apple pie. Designers got the idea from last year's Colloquium."
unquote.
It seems that Amsat-UK Colloquium breakthroughs helped other P3D designs, not only the propulsion. Followers of P3D will know that short backfire antennas are to be included, as are parabolics; pity no-one acknowledged the source of the ideas as the UoS bar and shower rooms. Also, solar panel deployment is expected to be based on the actions of Amsat-UK Committee when they were waving their arms, trying to get everyone into the hall. It has been revealed that visitors to the 1994 Colloquium will be force-fed the mixture and equipped with tanks in order to collect the estimated 184Kg of propellant required.

** Help Column - Satellite FAQ **
Dear doctor:
Q. I built my own space rocket but it suffers from in-flight instability.

What can I do to make it more reliable ?
A. Use a longer stick.

Q. How can I make my 300bps modem work on the 9600bps satellites ?
A. run it from 384 volts instead of 12v.

Q. When will Dove speak ?
A. On re-entry; software for "aaaaarrrrggghhh" is easy.

Q. How can I afford the new gear for ALL the amateur satellites ?
A. Rob a bank.

Q. How can I get satellite DXCC in 90 minutes ?
A. Become a NASA mission specialist.

Q. How can I keep my UO-22 directory up-to-date ?
A. Patience; miracles are easy but the impossible takes a little longer.

Q. Why is Amsat-UK's new "Guide to Amateur Satellite Operations" book called "The New Guide to Amateur Satellite Operations" ?
A. Because its new.

Q. Why do Amsat-NA have to grovel for P3D donations of 10c/member while all Amsat-UK have to do is ask politely and receive thousands of pounds ?
A. The Brits put satellites before feeding their families.

Q. Why doesn't UO-11's digitalker answer me ?
A. You need a UO-11 voice modem.

Q. How can I keep my UO-22 directory up-to-date ?
A. Become a NASA mission specialist.

Q. How can I work FO-20 at 9600bps ?
A. Use the analogue transponder.

** Voice Satellites **
The first (amateur) voice from, rather than via, space came from UO-9; they have also come from UO-11, DO-17, AO-21, UO-22, KO-23, STS & MIR. The STS and MIR people are regularly supplied with food but we can now reveal how the men aboard the other "speaking" satellites are fed. Special containers are attached to the spacecraft's mains cord and lifted about 50Km by a spring mechanism. After that, centrifugal force takes over and propels the container the rest of the way. Once stocks have been depleted the containers, of aluminium foil, are filled with waste products and stored until the next meteor shower is due and are then discarded to rapidly re-enter without anyone realising what they were. They don't all burn up on re-entry. So next time you get showered by this polar foil material remember its all in the name of science.

Remember - you heard it first from Amsat-UK

Please use BID$ AMS_APR01 for terrestrial packet.

73 Richard G3RWL

451. ORBS$091.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:45:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-091.o.1994@ampr.org>
Source record: 27704
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-091.O
Orbital Elements 091.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94090.04857020
Element set: 272
Inclination: 27.1828 deg
RA of node: 334.6164 deg
Eccentricity: 0.6021586
Arg of perigee: 166.4731 deg
Mean anomaly: 222.3171 deg
Mean motion: 2.05878019 rev/day
Decay rate: -1.26e-06 rev/day^2
Epoch rev: 8117
Checksum: 283

Satellite: UO-11
Catalog number: 14781
Epoch time: 94088.54614116
Element set: 677
Inclination: 97.7907 deg
RA of node: 106.9891 deg
Eccentricity: 0.0011724
Arg of perigee: 159.5745 deg
Mean anomaly: 200.5932 deg
Mean motion: 14.69179967 rev/day
Decay rate: 3.10e-06 rev/day^2
Epoch rev: 53861
Checksum: 341

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94087.86953292
Element set: 885
Inclination: 82.9247 deg
RA of node: 28.2040 deg
Eccentricity: 0.0010048
Arg of perigee: 247.5026 deg
```

Mean anomaly: 112.5060 deg
Mean motion: 13.72333957 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 33889
Checksum: 316

Satellite: AO-13
Catalog number: 19216
Epoch time: 94089.57476926
Element set: 897
Inclination: 57.8673 deg
RA of node: 260.4952 deg
Eccentricity: 0.7210521
Arg of perigee: 338.0957 deg
Mean anomaly: 2.2906 deg
Mean motion: 2.09726187 rev/day
Decay rate: -4.05e-06 rev/day^2
Epoch rev: 4436
Checksum: 338

Satellite: FO-20
Catalog number: 20480
Epoch time: 94089.46791516
Element set: 672
Inclination: 99.0274 deg
RA of node: 256.2045 deg
Eccentricity: 0.0541263
Arg of perigee: 157.7469 deg
Mean anomaly: 204.8111 deg
Mean motion: 12.83224806 rev/day
Decay rate: -2.6e-07 rev/day^2
Epoch rev: 19403
Checksum: 305

Satellite: AO-21
Catalog number: 21087
Epoch time: 94087.23338553
Element set: 448
Inclination: 82.9383 deg
RA of node: 202.5987 deg
Eccentricity: 0.0035057
Arg of perigee: 312.0281 deg
Mean anomaly: 47.7812 deg
Mean motion: 13.74536472 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 15846
Checksum: 318

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94087.91832396

Element set: 675
Inclination: 82.9180 deg
RA of node: 70.9759 deg
Eccentricity: 0.0029421
Arg of perigee: 335.5442 deg
Mean anomaly: 24.4319 deg
Mean motion: 13.74038100 rev/day
Decay rate: 7.3e-07 rev/day^2
Epoch rev: 15762
Checksum: 315

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94089.09349977
Element set: 248
Inclination: 1.5156 deg
RA of node: 104.5135 deg
Eccentricity: 0.2923641
Arg of perigee: 175.5080 deg
Mean anomaly: 188.1427 deg
Mean motion: 1.42202601 rev/day
Decay rate: -1.05e-06 rev/day^2
Epoch rev: 7
Checksum: 273

/EX

452. ORBS$091.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:47:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-091.d.1994@ampr.org>
Source record: 27705
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-091.D
Orbital Elements 091.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94089.78002368
Element set: 977
Inclination: 98.5902 deg
RA of node: 175.6151 deg
Eccentricity: 0.0011994
Arg of perigee: 63.2614 deg
Mean anomaly: 296.9794 deg
Mean motion: 14.29833748 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 21838
Checksum: 351

Satellite: AO-16
Catalog number: 20439
Epoch time: 94089.20880979
Element set: 777
Inclination: 98.6002 deg
RA of node: 176.2024 deg
Eccentricity: 0.0012329
Arg of perigee: 65.1942 deg
Mean anomaly: 295.0533 deg
Mean motion: 14.29888159 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 21831
Checksum: 325

Satellite: DO-17
Catalog number: 20440
Epoch time: 94089.24080620
Element set: 776
Inclination: 98.5996 deg
RA of node: 176.5305 deg
Eccentricity: 0.0012438
Arg of perigee: 64.3153 deg
```

Mean anomaly: 295.9310 deg
Mean motion: 14.30027317 rev/day
Decay rate: 6.3e-07 rev/day^2
Epoch rev: 21833
Checksum: 297

Satellite: WO-18
Catalog number: 20441
Epoch time: 94090.19431294
Element set: 778
Inclination: 98.6012 deg
RA of node: 177.4806 deg
Eccentricity: 0.0013046
Arg of perigee: 61.5324 deg
Mean anomaly: 298.7177 deg
Mean motion: 14.30002526 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 21847
Checksum: 294

Satellite: LO-19
Catalog number: 20442
Epoch time: 94089.26815097
Element set: 776
Inclination: 98.6013 deg
RA of node: 176.8020 deg
Eccentricity: 0.0013338
Arg of perigee: 63.8292 deg
Mean anomaly: 296.4260 deg
Mean motion: 14.30097329 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21835
Checksum: 312

Satellite: UO-22
Catalog number: 21575
Epoch time: 94088.19621400
Element set: 478
Inclination: 98.4399 deg
RA of node: 164.2896 deg
Eccentricity: 0.0007602
Arg of perigee: 162.2933 deg
Mean anomaly: 197.8526 deg
Mean motion: 14.36902851 rev/day
Decay rate: 8.2e-07 rev/day^2
Epoch rev: 14159
Checksum: 332

Satellite: KO-23
Catalog number: 22077
Epoch time: 94089.40023487

Element set: 373
Inclination: 66.0807 deg
RA of node: 84.9415 deg
Eccentricity: 0.0012132
Arg of perigee: 306.9711 deg
Mean anomaly: 53.0198 deg
Mean motion: 12.86285590 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7665
Checksum: 306

Satellite: AO-27
Catalog number: 22825
Epoch time: 94090.23004933
Element set: 274
Inclination: 98.6599 deg
RA of node: 166.8062 deg
Eccentricity: 0.0009628
Arg of perigee: 75.4070 deg
Mean anomaly: 284.8171 deg
Mean motion: 14.27615820 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 2656
Checksum: 317

Satellite: IO-26
Catalog number: 22826
Epoch time: 94090.21670618
Element set: 274
Inclination: 98.6600 deg
RA of node: 166.8192 deg
Eccentricity: 0.0010132
Arg of perigee: 76.2498 deg
Mean anomaly: 283.9812 deg
Mean motion: 14.27718516 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 2656
Checksum: 309

Satellite: KO-25
Catalog number: 22830
Epoch time: 94089.19391177
Element set: 277
Inclination: 98.5601 deg
RA of node: 163.8935 deg
Eccentricity: 0.0012606
Arg of perigee: 49.5068 deg
Mean anomaly: 310.7222 deg
Mean motion: 14.28043381 rev/day
Decay rate: 6.1e-07 rev/day^2
Epoch rev: 2642

```
Checksum: 300

/EX
```

453. ORBS$091.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:49:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-091.w.1994@ampr.org>
Source record: 27706
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-091.W
Orbital Elements 091.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94081.96146229
Element set: 759
Inclination: 99.0648 deg
RA of node: 131.4010 deg
Eccentricity: 0.0015937
Arg of perigee: 101.6666 deg
Mean anomaly: 258.6297 deg
Mean motion: 14.13600524 rev/day
Decay rate: 1.21e-06 rev/day^2
Epoch rev: 47816
Checksum: 312

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94082.90887763
Element set: 658
Inclination: 98.5123 deg
RA of node: 94.5094 deg
Eccentricity: 0.0012333
Arg of perigee: 216.3165 deg
Mean anomaly: 143.7179 deg
Mean motion: 14.24874536 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 39046
Checksum: 336

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94089.18881615
Element set: 275
Inclination: 82.5443 deg
RA of node: 331.4359 deg
Eccentricity: 0.0018219
Arg of perigee: 45.0857 deg
```

Mean anomaly: 315.1779 deg
Mean motion: 13.84712261 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 31142
Checksum: 311

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94089.83574800
Element set: 272
Inclination: 82.5443 deg
RA of node: 19.1260 deg
Eccentricity: 0.0018339
Arg of perigee: 97.2779 deg
Mean anomaly: 263.0433 deg
Mean motion: 13.16965918 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27294
Checksum: 324

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94083.23885812
Element set: 572
Inclination: 99.1670 deg
RA of node: 70.0925 deg
Eccentricity: 0.0012545
Arg of perigee: 15.7107 deg
Mean anomaly: 344.4450 deg
Mean motion: 14.12969487 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 28322
Checksum: 300

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94089.36906685
Element set: 274
Inclination: 82.5194 deg
RA of node: 206.7454 deg
Eccentricity: 0.0015814
Arg of perigee: 87.7360 deg
Mean anomaly: 272.5605 deg
Mean motion: 13.84360092 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 25678
Checksum: 341

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94090.37821933

Element set: 14
Inclination: 82.5542 deg
RA of node: 323.7875 deg
Eccentricity: 0.0006847
Arg of perigee: 112.9105 deg
Mean anomaly: 247.2662 deg
Mean motion: 13.04412938 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21275
Checksum: 284

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94088.50123196
Element set: 776
Inclination: 82.5419 deg
RA of node: 271.7609 deg
Eccentricity: 0.0017267
Arg of perigee: 14.3017 deg
Mean anomaly: 345.8619 deg
Mean motion: 13.84189951 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 18959
Checksum: 337

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94090.21888621
Element set: 930
Inclination: 98.8335 deg
RA of node: 112.8405 deg
Eccentricity: 0.0013476
Arg of perigee: 222.0473 deg
Mean anomaly: 137.9657 deg
Mean motion: 14.01311217 rev/day
Decay rate: -5.2e-07 rev/day^2
Epoch rev: 18278
Checksum: 300

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94089.84563327
Element set: 785
Inclination: 82.5242 deg
RA of node: 208.2980 deg
Eccentricity: 0.0011952
Arg of perigee: 268.4342 deg
Mean anomaly: 91.5449 deg
Mean motion: 13.83575783 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 17692

Checksum: 340

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94089.43280640
Element set: 683
Inclination: 82.5388 deg
RA of node: 225.2547 deg
Eccentricity: 0.0014229
Arg of perigee: 26.7101 deg
Mean anomaly: 333.4745 deg
Mean motion: 13.16460745 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14099
Checksum: 293

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94074.00396538
Element set: 964
Inclination: 98.6278 deg
RA of node: 103.8182 deg
Eccentricity: 0.0013418
Arg of perigee: 145.8585 deg
Mean anomaly: 214.3456 deg
Mean motion: 14.22379795 rev/day
Decay rate: 1.80e-06 rev/day^2
Epoch rev: 14714
Checksum: 320

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94088.27818630
Element set: 690
Inclination: 82.5574 deg
RA of node: 173.1754 deg
Eccentricity: 0.0014560
Arg of perigee: 41.6370 deg
Mean anomaly: 318.5859 deg
Mean motion: 13.16828652 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12594
Checksum: 321

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94089.43710956
Element set: 285
Inclination: 82.5458 deg
RA of node: 268.8400 deg
Eccentricity: 0.0023835

```
Arg of perigee: 84.7709 deg
Mean anomaly: 275.6182 deg
Mean motion: 13.83003171 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 2920
Checksum: 311

/EX
```

454. AO-27&21, need kep's

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:50:02 UTC
From: andrews@fms.com
Message-ID: <CnKAnG.GIM@fms.com>
Source record: 27707

Hello all,

After reading about AO-27 and opperating AO-21 previously, I _really_
need a printout on these two satellites!

My ICBM is (this may need a little decoding!):
41 - 10 - 46
81 - 57 - 56
(this is near the Cleveland Ohio area)

I _really_ need a printout on these two satelites!!!

See ya on AO-27!!!!!!!

So long for now.... (Yea!)

--
Mesmerized by a decade of hate, ! AMATEUR = N8OFS
Flowers and remorse, ! ARMY MARS = AAN5HJT
Fading vision lost in time, ! CB = THE NEON KNIGHT
Tragedy on course!!! - Frontline Assembly ! HACKER = TH3 N30N KN16Ht

455. ORBS$091.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:51:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-091.m.1994@ampr.org>
Source record: 27708
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-091.M
Orbital Elements 091.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94089.68812903
Element set: 267
Inclination: 98.6555 deg
RA of node: 166.3095 deg
Eccentricity: 0.0011064
Arg of perigee: 65.4928 deg
Mean anomaly: 294.7409 deg
Mean motion: 14.28014942 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 2649
Checksum: 332

Satellite: MIR
Catalog number: 16609
Epoch time: 94090.25081547
Element set: 549
Inclination: 51.6462 deg
RA of node: 216.9197 deg
Eccentricity: 0.0015558
Arg of perigee: 91.3363 deg
Mean anomaly: 268.9434 deg
Mean motion: 15.58441517 rev/day
Decay rate: 8.348e-05 rev/day^2
Epoch rev: 49380
Checksum: 334

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94089.87951733
Element set: 462
Inclination: 28.4691 deg
RA of node: 18.9736 deg
Eccentricity: 0.0006088
Arg of perigee: 352.0216 deg
```

Mean anomaly: 8.0277 deg
Mean motion: 14.90551165 rev/day
Decay rate: 1.063e-05 rev/day^2
Epoch rev: 1769
Checksum: 307

Satellite: GRO
Catalog number: 21225
Epoch time: 94087.37564364
Element set: 77
Inclination: 28.4619 deg
RA of node: 72.9760 deg
Eccentricity: 0.0003357
Arg of perigee: 25.2579 deg
Mean anomaly: 334.8185 deg
Mean motion: 15.40487736 rev/day
Decay rate: 4.639e-05 rev/day^2
Epoch rev: 4446
Checksum: 326

Satellite: UARS
Catalog number: 21701
Epoch time: 94088.55112080
Element set: 498
Inclination: 56.9828 deg
RA of node: 118.1810 deg
Eccentricity: 0.0004332
Arg of perigee: 96.2144 deg
Mean anomaly: 263.9383 deg
Mean motion: 14.96463997 rev/day
Decay rate: -2.513e-05 rev/day^2
Epoch rev: 13901
Checksum: 305

/EX

456. ORBS$091.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:53:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-091.n.1994@ampr.org>
Source record: 27709
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-091.N
2Line Orbital Elements 091.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX April 1, 1994
BID: $ORBS-091.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94090.04857020 -.00000126 00000-0 10000-3 0 2727
2 14129 27.1828 334.6164 6021586 166.4731 222.3171 2.05878019 81175
UO-11
1 14781U 84021B 94088.54614116 .00000310 00000-0 60435-4 0 6772
2 14781 97.7907 106.9891 0011724 159.5745 200.5932 14.69179967538610
RS-10/11
1 18129U 87054A 94087.86953292 .00000048 00000-0 35789-4 0 8859
2 18129 82.9247 28.2040 0010048 247.5026 112.5060 13.72333957338899
AO-13
1 19216U 88051B 94089.57476926 -.00000405 00000-0 10000-4 0 8979
2 19216 57.8673 260.4952 7210521 338.0957 2.2906 2.09726187 44366
FO-20
1 20480U 90013C 94089.46791516 -.00000026 00000-0 82466-5 0 6724
2 20480 99.0274 256.2045 0541263 157.7469 204.8111 12.83224806194031
AO-21
1 21087U 91006A 94087.23338553 .00000093 00000-0 82657-4 0 4487
2 21087 82.9383 202.5987 0035057 312.0281 47.7812 13.74536472158468
RS-12/13
1 21089U 91007A 94087.91832396 .00000073 00000-0 62203-4 0 6754
2 21089 82.9180 70.9759 0029421 335.5442 24.4319 13.74038100157622
ARSENE
1 22654U 93031B 94089.09349977 -.00000105 00000-0 00000 0 0 2486
2 22654 1.5156 104.5135 2923641 175.5080 188.1427 1.42202601 77
UO-14
1 20437U 90005B 94089.78002368 .00000055 00000-0 38442-4 0 9775
2 20437 98.5902 175.6151 0011994 63.2614 296.9794 14.29833748218380
AO-16
1 20439U 90005D 94089.20880979 .00000052 00000-0 37099-4 0 7778
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2 20439 98.6002 176.2024 0012329 65.1942 295.0533 14.29888159218318
DO-17
1 20440U 90005E 94089.24080620 .00000063 00000-0 41255-4 0 7769
2 20440 98.5996 176.5305 0012438 64.3153 295.9310 14.30027317218339
WO-18
1 20441U 90005F 94090.19431294 .00000051 00000-0 36697-4 0 7786
2 20441 98.6012 177.4806 0013046 61.5324 298.7177 14.30002526218473
LO-19
1 20442U 90005G 94089.26815097 .00000060 00000-0 40132-4 0 7767
2 20442 98.6013 176.8020 0013338 63.8292 296.4260 14.30097329218359
UO-22
1 21575U 91050B 94088.19621400 .00000082 00000-0 42436-4 0 4782
2 21575 98.4399 164.2896 0007602 162.2933 197.8526 14.36902851141598
KO-23
1 22077U 92052B 94089.40023487 -.00000037 00000-0 10000-3 0 3735
2 22077 66.0807 84.9415 0012132 306.9711 53.0198 12.86285590 76650
AO-27
1 22825U 93061C 94090.23004933 .00000064 00000-0 43978-4 0 2745
2 22825 98.6599 166.8062 0009628 75.4070 284.8171 14.27615820 26560
IO-26
1 22826U 93061D 94090.21670618 .00000050 00000-0 37923-4 0 2741
2 22826 98.6600 166.8192 0010132 76.2498 283.9812 14.27718516 26561
KO-25
1 22830U 93061H 94089.19391177 .00000061 00000-0 41952-4 0 2773
2 22830 98.5601 163.8935 0012606 49.5068 310.7222 14.28043381 26423
NOAA-9
1 15427U 84123A 94081.96146229 .00000121 00000-0 88127-4 0 7596
2 15427 99.0648 131.4010 0015937 101.6666 258.6297 14.13600524478169
NOAA-10
1 16969U 86073A 94082.90887763 .00000064 00000-0 45657-4 0 6589
2 16969 98.5123 94.5094 0012333 216.3165 143.7179 14.24874536390466
MET-2/17
1 18820U 88005A 94089.18881615 .00000060 00000-0 40354-4 0 2751
2 18820 82.5443 331.4359 0018219 45.0857 315.1779 13.84712261311424
MET-3/2
1 19336U 88064A 94089.83574800 .00000051 00000-0 10000-3 0 2727
2 19336 82.5443 19.1260 0018339 97.2779 263.0433 13.16965918272948
NOAA-11
1 19531U 88089A 94083.23885812 .00000062 00000-0 58133-4 0 5722
2 19531 99.1670 70.0925 0012545 15.7107 344.4450 14.12969487283226
MET-2/18
1 19851U 89018A 94089.36906685 .00000056 00000-0 36961-4 0 2749
2 19851 82.5194 206.7454 0015814 87.7360 272.5605 13.84360092256784
MET-3/3
1 20305U 89086A 94090.37821933 .00000044 00000-0 10000-3 0 149
2 20305 82.5542 323.7875 0006847 112.9105 247.2662 13.04412938212758
MET-2/19
1 20670U 90057A 94088.50123196 .00000024 00000-0 79036-5 0 7761
2 20670 82.5419 271.7609 0017267 14.3017 345.8619 13.84189951189594
FY-1/2
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1 20788U 90081A 94090.21888621 -.00000052 00000-0 -61897-5 0 9301
2 20788 98.8335 112.8405 0013476 222.0473 137.9657 14.01311217182780
MET-2/20
1 20826U 90086A 94089.84563327 .00000049 00000-0 31369-4 0 7851
2 20826 82.5242 208.2980 0011952 268.4342 91.5449 13.83575783176926
MET-3/4
1 21232U 91030A 94089.43280640 .00000051 00000-0 10000-3 0 6830
2 21232 82.5388 225.2547 0014229 26.7101 333.4745 13.16460745140997
NOAA-12
1 21263U 91032A 94074.00396538 .00000180 00000-0 10013-3 0 9646
2 21263 98.6278 103.8182 0013418 145.8585 214.3456 14.22379795147143
MET-3/5
1 21655U 91056A 94088.27818630 .00000051 00000-0 10000-3 0 6902
2 21655 82.5574 173.1754 0014560 41.6370 318.5859 13.16828652125949
MET-2/21
1 22782U 93055A 94089.43710956 .00000034 00000-0 16948-4 0 2855
2 22782 82.5458 268.8400 0023835 84.7709 275.6182 13.83003171 29200
POSAT
1 22829U 93061G 94089.68812903 .00000066 00000-0 44108-4 0 2670
2 22829 98.6555 166.3095 0011064 65.4928 294.7409 14.28014942 26490
MIR
1 16609U 86017A 94090.25081547 .00008348 00000-0 11343-3 0 5497
2 16609 51.6462 216.9197 0015558 91.3363 268.9434 15.58441517493803
HUBBLE
1 20580U 90037B 94089.87951733 .00001063 00000-0 91113-4 0 4621
2 20580 28.4691 18.9736 0006088 352.0216 8.0277 14.90551165 17696
GRO
1 21225U 91027B 94087.37564364 .00004639 00000-0 10470-3 0 771
2 21225 28.4619 72.9760 0003357 25.2579 334.8185 15.40487736 44468
UARS
1 21701U 91063B 94088.55112080 -.00002513 00000-0 -19868-3 0 4983
2 21701 56.9828 118.1810 0004332 96.2144 263.9383 14.96463997139015
/EX
```

457. AO-21&27, need kep's

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 03:56:12 UTC
From: andrews@fms.COM
Message-ID: <m0pmaL6-0000u5C@fms.com>
Source record: 27710

Hello all...

I _really_ need a printout of AO-21 & AO-27!!!!!!!

I have opperated AO-21 before, but can't wait to try AO-27 using QRP!

My ICBM (this may need some decoding!) is:
41 - 10 - 46
81 - 57 - 56
(I am located in the Cleveland Ohio area, if this helps)

I would _really appreciate_ knowing when _both_ sat's will be overhead.

See ya on AO-27!!!!!!!

So long for now... (yea!)

--
Mesmerized by a decade of hate, ! AMATEUR = N8OFS
Flowers and remorse, ! ARMY MARS = AAN5HJT
Fading vision lost in time, ! CB = THE NEON KNIGHT
Tragedy on course!!! - Frontline Assembly ! HACKER = TH3 N30N KN16Ht

458. * SpaceNews 04-Apr-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 14:58:13 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0404.1994@ampr.org>
Source record: 27811
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0404
* SpaceNews 04-Apr-94 *

BID: $SPC0404

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SpaceNews
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MONDAY APRIL 4, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* LUNAR EXPLORATION CONFERENCE SCHEDULED *
==========
International Space Enterprises (ISE), a U.S. corporation planning a series of privately-financed missions to the Moon, has been selected to co-host an International Lunar Exploration Conference and Apollo commemorative event in San Diego. The conference is tentatively scheduled for 13-16 November 1994, which coincides with the 25th anniversary of America's second piloted mission to the Moon, Apollo 12. In addition to bringing together lunar scientists from all over the world, the event will kick off a nationwide educational initiative, whose ultimate goal is to fly a student experiment to the Moon by December 1997, the 25th anniversary of Apollo 17, the final Apollo mission to the Moon.

The November event will be co-sponsored by the National Space Society and the Spaceweek International Association, non-profit organizations dedicated to the expansion of human activities in space. The San Diego chapter of the National Space Society will work with ISE to develop the technical program for the conference, which will feature presentations and workshops on a variety of topics relating to exploration and utilization of the Moon. Spaceweek will manage the Apollo 12 commemorative event, planned as a gala fund-raising banquet on the evening of 15 November. Proceeds from the conference and banquet will be used for development and flight of the student experiment, which will be selected through a nationwide competition held during the 1995-96 academic year.

The specific site for the November conference will be selected within the next few weeks, and a preliminary conference program will be released in June. Details of the nationwide student experiment contest - which will be designed to involve students at all academic levels in the 1997 lunar mission - will be announced as they become available and a draft contest guidelines document will be presented at the November event. For additional information

please contact Tom Kessler of ISE at (619) 637-5772.

[Info via Franklin Antonio]

* UFO ON 2-METERS *
==========
G3IOR reported an unidentified satellite sending telemetry on 145.592 MHz. It was first heard by G3JQI in England at 18:50 UTC "dopplering" down until a 18:55 UTC LOS on 16-Mar-94.

Keep an ear out for this spacecraft, and send reception reports to SpaceNews.

* OSCAR-11 NEWS *
==========
G3RWL reports that UoSAT-OSCAR-11 is about to re-commence its regular news bulletin transmissions. The news bulletins are transmitted in ASCII on a frequency of 145.826 MHz FM AFSK at 1200 bps.

* SpaceNews AVAILABILITY *
==========
SpaceNews archives are now available via anonymous FTP at pilot.njin.net! Files may be found under the /pub/SpaceNews directory. All issues from 1993 have been zipped together in one file, while 1994 issues are available separately in ASCII form. The IP address for pilot.njin.net is 128.6.7.38, and answers to frequently asked questions, satellite software, and space related GIF images will be added in the not-too-distant future.

The latest issue of SpaceNews has been available to those with Internet access for some time by using the Unix "finger" command as follows:

finger magliaco@pilot.njin.net

Those without "finger" capabilities can receive SpaceNews via e-mail by sending a blank message to jfesler@netcom.com with a subject of #finger magliaco@pilot.njin.net.

SpaceNews is also available on Usenet under the newsgroups of rec.radio.amateur.space and sci.space.news, thanks to the folks at the University of California at San Diego. It is also available on the Amateur Packet Radio Network, and several of the "Pacsat" satellites, thanks to Pacsat ground stations who upload the issues to the birds each week.

SpaceNews has also been known to appear on the packet radio personal message system operated by the Cosmonauts on the Russian space station Mir. :-)

* SpaceNews BBS *
==========
A "SpaceNews" packet radio BBS has been established by Mario, KD6ILO in Tacoma, Washington. Mario reports the BBS carries SpaceNews, AMSAT, and NASA information, and serves the Puget Sound area on a frequency of 144.910 MHz. The BBS is also linked to the UoSAT-OSCAR-22 satellite through the N7RSN SatGate also located in Tacoma, WA.

* FO-20 SCHEDULE *
==================
The FO-20 command station announced that FO-20 will be placed in Mode JA
(Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through
26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:
06-Apr-94 06:45 -to- 13-Apr-94 07:10 UTC
20-Apr-94 07:35 -to- 27-Apr-94 07:55 UTC
11-May-94 06:54 -to- 18-May-94 07:20 UTC

Digital mode:
Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

GM1SXX KA1CNK ON1EN KD6EFQ KD6ILO N8QPO

and First Lt. Walter Witt, N8DKI, of the USAF Auxillary Civil Air Patrol
who uses SpaceNews in teaching aerospace science to cadets between the ages
of 13 and 21.

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

459. AO-27 Information

Newsgroup: rec.radio.amateur.space
Date: 1994-04-01 20:55:28 UTC
From: JAY@medicine.dmed.iupui.edu
Message-ID: <JAY.16.2D9C8A40@medicine.dmed.iupui.edu>
Source record: 27812

I have tried to monitor AO-27, but I haven't heard anything. I have been able to monitor AO-21 (at 145.987) with a HT with rubber duck antenna, but I can't hear the AO-27 with a large roof mounted antenna. According to the STS+ program, AO-27 is supposed to get close to Indianapolis on 4/3/94 at 11:28 - 11:43AM (EST). From the information I have found It's downlink frequency is 436.8 and it uses FM voice. Is this correct?

Thanks for your help.

Jay

460. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-04-02 00:09:00 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.765245340@afit.af.mil>
Source record: 27813
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.info on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (also updated daily) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a eleven-character name.

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

461. Two-Line Orbital Element Sets (TLE371)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-02 00:11:32 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.765245492@afit.af.mil>
Source record: 27814

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #371 -
Alouette 1
1 00424U 62049 94088.24992881 .00000079 00000-0 83203-4 0 9797
2 00424 80.4639 3.8721 0022977 323.7136 36.2448 13.67803733571477
ATS 3
1 03029U 67111A 94089.78254782 -.00000126 00000-0 10000-3 0 1731
2 03029 14.5982 8.2972 0009966 275.5531 80.4598 1.00273062 96641
Cosmos 398
1 04966U 71016A 94090.76308058 .00149950 71263-5 32276-3 0 1031
2 04966 51.4464 270.7386 1100416 136.9232 232.3451 13.70716302762053
Starlette
1 07646U 75010A 94089.27113332 -.00000133 00000-0 96056-5 0 7670
2 07646 49.8232 104.7688 0206057 75.5787 286.7877 13.82185806966936
LAGEOS
1 08820U 76039A 94089.49661150 .00000021 00000-0 10000-3 0 9790
2 08820 109.8282 108.6520 0044431 301.9584 57.6725 6.38664358162121
ETS-2
1 09852U 77014A 94070.85048620 -.00000159 00000-0 10000-3 0 9581
2 09852 11.9850 42.6477 0002572 4.2921 155.3539 0.99995589 9681
GOES 2
1 10061U 77048A 94089.25155824 .00000064 00000-0 10000-3 0 3129
2 10061 11.0581 46.6381 0002383 11.5975 83.7582 1.00278389 6320
IUE
1 10637U 78012A 94085.55612990 -.00000184 00000-0 10000-3 0 9862
2 10637 34.4846 96.2550 1311140 33.3880 203.2523 1.00294093 11895
GPS BI-01
1 10684U 78020A 94075.33863500 -.00000014 00000-0 10000-3 0 2598
2 10684 64.5943 48.2717 0063538 163.9849 196.2234 1.98069718103095
GPS BI-02
1 10893U 78047A 94089.39522627 .00000001 00000-0 10000-3 0 551
2 10893 63.5716 286.9513 0213668 13.4558 347.0871 2.01626741116486
```

```
GOES 3
1 10953U 78062A 94088.42517051 .00000069 00000-0 10000-3 0 2863
2 10953 9.9885 49.4291 0004403 107.7352 9.0420 1.00292336 10927
SeaSat 1
1 10967U 78064A 94088.53479424 .00000093 00000-0 75362-4 0 2740
2 10967 108.0043 297.3897 0001440 273.9152 86.1826 14.37941137824919
GPS BI-03
1 11054U 78093A 94089.69652189 .00000003 00000-0 10000-3 0 1690
2 11054 63.2803 284.0673 0043547 175.0931 184.9611 1.93505469112998
Nimbus 7
1 11080U 78098A 94088.70137872 -.00000016 00000-0 23834-4 0 3790
2 11080 99.0670 335.2576 0009347 350.7934 9.3049 13.83733642779084
GPS BI-04
1 11141U 78112A 94089.04305217 -.00000017 00000-0 00000+0 0 8716
2 11141 64.6366 48.9586 0048442 24.4405 335.7479 1.92894683 2259
GPS BI-05
1 11690U 80011A 94090.62653899 -.00000011 00000-0 10000-3 0 7699
2 11690 64.9365 49.6338 0140760 196.7771 162.7443 2.00553265117982
GPS BI-06
1 11783U 80032A 94082.47457936 .00000046 00000-0 10000-3 0 9591
2 11783 62.6918 281.1017 0209111 29.2917 331.9050 2.03456672102210
GOES 5
1 12472U 81049A 94088.26421226 .00000088 00000-0 10000-3 0 7585
2 12472 6.6572 58.9992 0005254 347.4041 94.7383 1.00290290 4961
Cosmos 1383
1 13301U 82066A 94088.82311985 .00000027 00000-0 14810-4 0 2772
2 13301 82.9336 7.9468 0026961 316.9704 42.9333 13.68052962586576
LandSat 4
1 13367U 82072A 94088.20003723 .00000148 00000-0 42911-4 0 4646
2 13367 98.1875 148.1484 0007804 136.0000 224.1820 14.57124483622412
IRAS
1 13777U 83004A 94087.53962894 .00000398 00000-0 30415-3 0 5806
2 13777 98.9751 280.1620 0012172 172.1425 187.9931 13.99203970239869
Cosmos 1447
1 13916U 83021A 94088.91033243 .00000072 00000-0 60410-4 0 3783
2 13916 82.9405 70.3299 0036244 250.3266 109.3988 13.74306903552447
TDRS 1
1 13969U 83026B 94085.91179867 -.00000199 00000-0 10000-4 0 2865
2 13969 7.5448 51.9648 0004150 56.2413 129.2031 1.00277147 13227
GOES 6
1 14050U 83041A 94091.23661382 -.00000144 00000-0 10000-3 0 1873
2 14050 5.4454 61.9482 0004533 325.3311 148.2203 1.00218269 12010
OSCAR 10
1 14129U 83058B 94090.04857020 -.00000126 00000-0 10000-3 0 2727
2 14129 27.1828 334.6164 6021586 166.4731 222.3171 2.05878019 53208
LandSat 5
1 14780U 84021A 94090.16086861 .00000150 00000-0 43173-4 0 453
2 14780 98.1718 151.4456 0005629 133.9564 226.2100 14.57130862536111
UoSat 2
1 14781U 84021B 94088.54614116 .00000310 00000-0 60435-4 0 6772
```

```
2 14781 97.7907 106.9891 0011724 159.5745 200.5932 14.69179967538610
GPS BI-09
1 15039U 84059A 94085.96475717 -.00000023 00000-0 10000-3 0 1831
2 15039 63.9183 43.6284 0056346 219.4094 140.1582 2.00559439 71691
Cosmos 1574
1 15055U 84062A 94088.16394447 .00000060 00000-0 47187-4 0 5772
2 15055 82.9549 124.0731 0029394 79.1719 281.2743 13.73602978489648
GPS BI-10
1 15271U 84097A 94089.37484063 .00000004 00000-0 10000-3 0 7838
2 15271 62.3957 280.8765 0144116 348.4306 11.2410 2.00578724 68874
Cosmos 1602
1 15331U 84105A 94089.16861297 .00000646 00000-0 73737-4 0 2698
2 15331 82.5364 151.7175 0022214 102.0126 258.3576 14.84355137512794
NOAA 9
1 15427U 84123A 94081.96146229 .00000121 00000-0 88127-4 0 7596
2 15427 99.0648 131.4010 0015937 101.6666 258.6297 14.13600524478169
GPS BI-11
1 16129U 85093A 94090.61681142 -.00000018 00000-0 10000-3 0 5782
2 16129 64.6695 45.6182 0130700 140.7418 220.1953 2.00563660 8603
Mir
1 16609U 86017A 94090.25081547 .00008348 00000-0 11343-3 0 5497
2 16609 51.6462 216.9197 0015558 91.3363 268.9434 15.58441517493803
SPOT 1
1 16613U 86019A 94089.78949368 .00000089 00000-0 62356-4 0 6614
2 16613 98.6956 164.8065 0001070 77.1878 282.9412 14.20051665105439
Cosmos 1766
1 16881U 86055A 94088.09194454 .00000656 00000-0 76843-4 0 1859
2 16881 82.5179 210.7465 0020360 126.7576 233.5452 14.83388588413589
EGP
1 16908U 86061A 94088.40662890 -.00000097 00000-0 00000+0 0 8747
2 16908 50.0122 329.6766 0011643 110.2539 249.9548 12.44409198 15459
NOAA 10
1 16969U 86073A 94082.90887763 .00000064 00000-0 45657-4 0 6589
2 16969 98.5123 94.5094 0012333 216.3165 143.7179 14.24874536390466
MOS-1
1 17527U 87018A 94088.22188622 .00000091 00000-0 99794-4 0 540
2 17527 99.0407 158.5657 0001157 80.2905 279.8381 13.94901222361795
GOES 7
1 17561U 87022A 94083.40485191 -.00000053 00000-0 10000-3 0 7840
2 17561 1.3689 76.7570 0003890 329.3032 168.8873 1.00272080 9126
Kvant-1
1 17845U 87030A 94091.02028733 .00004605 00000-0 65585-4 0 7986
2 17845 51.6468 213.0625 0015564 94.9512 265.2480 15.58451319464088
DMSP B5D2-3
1 18123U 87053A 94088.19842854 .00000107 00000-0 77277-4 0 3927
2 18123 98.7904 281.0774 0015184 50.2728 309.9779 14.15345769349696
RS-10/11
1 18129U 87054A 94087.86953292 .00000048 00000-0 35789-4 0 8859
2 18129 82.9247 28.2040 0010048 247.5026 112.5060 13.72333957338899
Meteor 2-16
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1 18312U 87068A 94088.99667162 .00000060 00000-0 41076-4 0 2754
2 18312 82.5502 274.6637 0012517 341.9808 18.0903 13.84026390334101
Meteor 2-17
1 18820U 88005A 94089.18881615 .00000060 00000-0 40354-4 0 2751
2 18820 82.5443 331.4359 0018219 45.0857 315.1779 13.84712261311424
DMSP B5D2-4
1 18822U 88006A 94077.00244064 .00000113 00000-0 68932-4 0 4723
2 18822 98.4542 295.6905 0005346 252.8359 107.2243 14.22936940317553
Glonass 34
1 19163U 88043A 94085.36109163 .00000089 00000-0 10000-3 0 8763
2 19163 65.0347 113.2274 0007447 170.5439 189.5448 2.13101998 44896
Glonass 36
1 19165U 88043C 94089.17096526 .00000047 00000-0 10000-3 0 2719
2 19165 65.0006 113.0632 0003386 282.3394 77.6853 2.13100969 45598
METEOSAT 3
1 19215U 88051A 94091.12009227 -.00000270 00000-0 10000-3 0 8854
2 19215 1.5606 73.0842 0002944 293.5455 150.3082 1.00254858 9140
AO-13
1 19216U 88051B 94089.57476926 -.00000405 00000-0 10000-4 0 8979
2 19216 57.8673 260.4952 7210521 338.0957 2.2906 2.09726187 12866
OKEAN 1
1 19274U 88056A 94086.65142127 .00000395 00000-0 46562-4 0 8853
2 19274 82.5153 311.9501 0018469 282.0488 77.8643 14.82137514309002
Meteor 3-2
1 19336U 88064A 94089.83574800 .00000051 00000-0 10000-3 0 2727
2 19336 82.5443 19.1260 0018339 97.2779 263.0433 13.16965918272948
Glonass 39
1 19503U 88085C 94087.78857952 -.00000049 00000-0 10000-3 0 1682
2 19503 65.7509 352.0288 0005895 179.9478 180.0877 2.13102360 43053
NOAA 11
1 19531U 88089A 94083.23885812 .00000062 00000-0 58133-4 0 5722
2 19531 99.1670 70.0925 0012545 15.7107 344.4450 14.12969487283226
TDRS 2
1 19548U 88091B 94089.22334643 -.00000302 00000-0 10000-3 0 8999
2 19548 0.8433 78.1057 0002295 274.5843 213.2538 1.00271121 7417
Glonass 40
1 19749U 89001A 94090.17448570 .00000040 00000-0 10000-3 0 3808
2 19749 64.9532 112.6385 0007125 261.8239 98.1447 2.13101349 40611
Glonass 41
1 19750U 89001B 94090.23109143 .00000040 00000-0 10000-3 0 2682
2 19750 64.9654 112.7054 0006885 266.1228 93.8278 2.13101743 40634
GPS BII-01
1 19802U 89013A 94089.94703447 .00000015 00000-0 10000-3 0 8853
2 19802 55.1000 142.8207 0033708 178.7420 181.3531 2.00576301 37485
Akebono
1 19822U 89016A 94090.37762079 .00011116 00000-0 54080-3 0 2330
2 19822 75.0859 226.4018 3831848 347.8684 5.0584 7.76895944103247
Meteor 2-18
1 19851U 89018A 94089.36906685 .00000056 00000-0 36961-4 0 2749
2 19851 82.5194 206.7454 0015814 87.7360 272.5605 13.84360092256784
```

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MOP-1
1 19876U 89020B 94087.41666667 -.00000161 00000-0 00000+0 0 113
2 19876 0.2695 59.0031 0001700 313.6123 304.7833 1.00262082 09
TDRS 3
1 19883U 89021B 94091.11175926 -.00000288 00000-0 00000+0 0 8979
2 19883 0.0372 136.8925 0001976 97.3341 314.2361 1.00272535 88693
GPS BII-02
1 20061U 89044A 94088.29866512 -.00000052 00000-0 10000-3 0 9051
2 20061 54.6875 319.7070 0127060 207.2191 152.1533 2.00565358 35193
Nadezhda 1
1 20103U 89050A 94088.18725646 .00000053 00000-0 40324-4 0 9777
2 20103 82.9612 346.7594 0037799 150.2123 210.1193 13.73835080237325
GPS BII-03
1 20185U 89064A 94090.13208663 .00000012 00000-0 10000-3 0 8901
2 20185 54.9104 143.4429 0010090 259.2260 100.7763 2.00576231 33808
GMS 4
1 20217U 89070A 94074.74108910 -.00000290 00000-0 10000-3 0 9974
2 20217 0.0530 351.8329 0000802 99.3024 128.8377 1.00265314 17152
GPS BII-04
1 20302U 89085A 94091.16051174 -.00000002 00000-0 10000-3 0 9026
2 20302 53.6160 259.9364 0002462 304.1295 55.8147 2.00563768 32626
Meteor 3-3
1 20305U 89086A 94090.37821933 .00000044 00000-0 10000-3 0 149
2 20305 82.5542 323.7875 0006847 112.9105 247.2662 13.04412938212758
COBE
1 20322U 89089A 94090.06715913 -.00000245 00000-0 -12829-3 0 9906
2 20322 98.9801 107.2194 0009420 122.5531 237.6545 14.03428945223430
Kvant-2
1 20335U 89093A 94091.02028733 .00004605 00000-0 65585-4 0 8784
2 20335 51.6468 213.0625 0015564 94.9512 265.2480 15.58451319464008
GPS BII-05
1 20361U 89097A 94088.67464712 .00000013 00000-0 10000-3 0 7830
2 20361 55.4821 85.4455 0070633 107.3966 253.3877 2.00559514 22056
SPOT 2
1 20436U 90005A 94090.39267363 .00000095 00000-0 65161-4 0 7715
2 20436 98.7224 165.9634 0001349 78.3833 281.7491 14.20030194217053
UO-14
1 20437U 90005B 94089.78002368 .00000055 00000-0 38442-4 0 9775
2 20437 98.5902 175.6151 0011994 63.2614 296.9794 14.29833748218380
UO-15
1 20438U 90005C 94089.74972568 .00000012 00000-0 21769-4 0 7775
2 20438 98.5925 174.6481 0011092 64.9407 295.2924 14.29169616218303
PACSAT
1 20439U 90005D 94089.20880979 .00000052 00000-0 37099-4 0 7778
2 20439 98.6002 176.2024 0012329 65.1942 295.0533 14.29888159218318
DO-17
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ProgressM22
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1 23035U 94019A 94089.03243001 .00010206 00000-0 13727-3 0 194
2 23035 51.6469 223.0348 0015402 86.4870 273.6755 15.58422645 1247
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

462. Re: AO-27 Information

Newsgroup: rec.radio.amateur.space
Date: 1994-04-02 11:59:25 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <rlong-020494065909@slip1-2.acs.ohio-state.edu>
Source record: 27816

In article <JAY.16.2D9C8A40@medicine.dmed.iupui.edu>,
JAY@medicine.dmed.iupui.edu (Jay Sissom) wrote:

> I have tried to monitor AO-27, but I haven't heard anything. I have been able
> to monitor AO-21 (at 145.987) with a HT with rubber duck antenna, but I can't
> hear the AO-27 with a large roof mounted antenna. According to the STS+
> program, AO-27 is supposed to get close to Indianapolis on 4/3/94 at 11:28 -
> 11:43AM (EST). From the information I have found It's downlink frequency is
> 436.8 and it uses FM voice. Is this correct?
>
> Thanks for your help.
>
> Jay

Latest information says that it is available for hams only on weekends
and when the satellite is in sunlight.

The commercial payload is in use more now.

73,
Ron w8gus.

463. GPS Information Sources

Newsgroup: rec.radio.amateur.space
Date: 1994-04-02 18:08:51 UTC
From: lang@unb.ca
Message-ID: <ID5773.D940402.T140319.lang@unb.ca>
Source record: 27817
Cross-posted to:
comp.infosystems.gis,rec.aviation.misc,rec.boats,rec.radio.amateur.space,sci.electronics,sci.geo.satellite-nav,sci.space.news

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GPS INFORMATION SOURCES
=======================
| (Revised 2 April 1994; revisions since previous update marked with bar '|')

Prepared by

Richard B. Langley
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Dept. of Geodesy and Geomatics Engineering
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Comments and additions to this document are welcome.

1. OFFICIAL CIVILIAN INFORMATION SOURCE
---------------------------------------

GPS INFORMATION CENTER
o Official U.S. Gov't. point of contact for civilian users
o Operated by U.S. Coast Guard
o Voice telephone recording for constellation status: (703) 313-5907
o Computer bulletin board: (703) 313-5910 (up to 14,400
bps) - almanacs, general information, etc.
Available via the Internet through the FedWorld BBS gateway system. Telnet
to fedworld.gov and from the top menu, type DD54 to connect to the GPSIC
BBS. See file GPSIC.VIA.INTERNET.INFO in the CANSPACE file archives (see
below) for more information.
o 24 hour watchstand personnel: (703) 313-5900; fax: (703) 313-5920
o WWV / WWVH shortwave broadcasts - constellation status
o DMA and USCG notices and broadcasts

2. ELECTRONIC INFORMATION SERVICES
----------------------------------

UNITED STATES NAVAL OBSERVATORY
o Responsible for monitoring behaviour of satellite clocks
o Clock data and general information on GPS available
from Automated Data Service (BBS): (202) 653-0155,
-0068, and -1079 (all bit rates); also available via the
```

Internet (192.5.41.239; anonymous ftp permitted; for telnet
connection, log in as ads -- a password is required -- GPS users may
contact Francine Vannicola, fmv@tycho.usno.navy.mil, for the password);
files also available via automated e-mail -- contact Francine Vannicola
for information
o USNO Series 4 mailed weekly bulletins contain satellite
clock info

INTERNATIONAL EARTH ROTATION SERVICE
o System maintained by IERS Central Bureau in Paris
o Earth orientation data from very long baseline interferometry,
laser ranging, and GPS observations
o Sets of space geodesy station coordinates
o UTC leap second announcements
o Access via anonymous ftp: mesiom.obspm.circe.fr (130.84.200.6)

2D SPACE OPERATIONS SQUADRON BBS
o Operated by U.S. Air Force 2d Space Operations Squadron, Falcon AFB, CO
o Service for GPS users from DoD, other U.S. GovUt. agencies, NATO, GovUt.
contractors
o Almanacs, NANUs, Operational Advisories
o DSN 560-6379; (719) 550-6379 (up to 2400 bps; N-8-1)

USAF GPS BBS AT HOLLOMAN AFB, NM
o Operated by U.S. Air Force 6585th Test Group; formerly at Yuma
o Daily almanac, observed range errors, tracking data
o (505) 679-1525 (variety of bit rates)

U.S. ARMY ELECTRONIC PROVING GROUND EGRIS BBS
o Operated by U.S Army
| o Accessible to military users and contractors worldwide
o NANUs, almanac and ephemeris data
| o For authorization to access EGRIS, contact Jack Underwood at USAEPG at
| (602) 533-8087
o (602) 538-3818 (300 and 1200 bps); (602) 538-3856 (9600 bps)

UNITED KINGDOM CIVIL SATELLITE GROUP ELECTRONIC BBS
o Operated by the University of Nottingham for the Royal Institution of
Navigation
o Full access is only available to members of UKCSG
o +44-602-422111 (2400 bps)

GPSINFO ELECTRONIC VIDEOTEX BBS
o Operated by the Survey Department of Rijkswaterstaat, (the Dutch
Ministry of Transport and Public Works), Delft
o +31-15-561959 (1200 and 2400 bps)

GPS INFO ELECTRONIC BBS
o Operated by Statens Kartverk (the Norwegian Mapping Authority),
Honefoss.
o +47-321-24045 and -18369 (1200 and 2400 bps)

GLOBAL SATELLITE SOFTWARE BBS
o Operated by Global Satellite Software, Inc., San Jose, California
o (408) 252-7358 (300 / 1200 / 2400 bps)

GIBS - GPS INFORMATIONS- UND BEOBACHTUNGSSYSTEM (INFORMATION AND OBSERVATION SYSTEM)
o Operated by Institut fuer Angewandte Geodasie, Frankfurt/M, Germany
o +49-69-6333-379 and -418 (up to 19200 bps)
o Available via Internet: Telnet to no5.ifag.de (141.74.240.25)
o A GPS status report in German is available at +49 341 5634-380. The report is updated at the beginning of each working day.
o Further information from gibs@no5.ifag.de

GRINEL - PROFESSIONAL ELECTRONICS BBS
o Verwoerdburg, South Africa
o Operated by Grinel Professional Services on behalf of the Southern Africa GPS User Group
o Status advisories, almanac
o +27-12-663-2583 (300 to 2400 bps)
o According to a report from South Africa dated 4 October 1993, this BBS is no longer active

KORT- OG MATRIKELSTYRELSEN BBS
o Kobenhavn, Denmark
o +45-3-185-3541 (up to 2400 bps)

ASSOCIATED CONSULTING INC. BBS
o Las Vegas, Nevada, U.S.A.
o (702) 647-9266 (300/1200/2400 bps)

NATIONAL LAND SURVEY BBS
o Gavle, Sweden
o +46-26-153748 (up to 19200 bps)

AUSLIG GEODESY ELECTRONIC BBS
o Operated by Australian Surveying and Land Information Group
o Constellation status, almanac data, related geodetic information
o +61-6-201-4375 or -4378 (300 to 600 bps)

CANADIAN SPACE GEODESY FORUM
o A LISTSERV-based discussion and information electronic mailing list
o Address of list: CANSPACE@UNB.CA
o Address for further information: LANG@UNB.CA
o File archive in "directory" PUB.CANSPACE on unbmvs1.csd.unb.ca (131.202.1.2) available by anonymous ftp
o File archive also available via Gopher;
URL: gopher://unbmvs1.csd.unb.ca:1570/1EXEC%3aCANSPACE
o Latest DoD NANUs may be obtained by "fingering" gps@geomac.se.unb.ca

| INTERNATIONAL GPS SERVICE FOR GEODYNAMICS
| o System maintained by IGS Central Bureau at JPL in Pasadena
| o Information about access to tracking data from global tracking network
| o Precise GPS satellite orbits generated by IGS Analysis Centers
| o Information about IGS Tracking Stations, Data Centers, Analysis Centers

| o GPS System Status Information
| o Access via anonymous ftp: sideshow.jpl.nasa.gov (128.149.70.41)

| CZECH TECHNICAL UNIVERSITY GPS/GLONASS GOPHER SERVER
| o Operated by the Group of Signals and Systems, Department of
| Radioelectronics, Faculty of Electrical Engineering, Czech Technical
| University, Prague
| o Host: gopher.feld.cvut.cz (147.32.192.5)
| o Bilingual: Czech/English
| o Data concerning Navstar GPS and GLONASS including the status of the
| systems (number of working satellites and whether they are usable or not)
| and almanac data for all satellites.
| o All data are based on the monitoring of both systems at the Czech Technical
| University
| o Suggestions and comments should be forwarded to BROUM@feld.cvut.cz or
| SEIDL@feld.cvut.cz

| WORLD WIDE WEB
| Hal Mueller of the Dept. of Agricultural Engineering at Texas A&M University
| has put together a very good hypertext document containing pointers to a
| number of items on GPS along with ones on GIS, remote sensing, and various
| other geosciences that can be found on the Internet. The uniform resource
| locator (URL) for the hypertext document is
| http://ageninfo.tamu.edu/geoscience.html
| Simply enter the URL into Mosaic or another WWW browser to access the
| document.

OTHER GPS MAILING LISTS
o GPS DIGEST
Moderated by Andy Arkusinski and Ken Jongsma of Smiths Industries, Grand
Rapids, MI.

According to the moderators ...
The GPS Digest is a forum for the discussion of topics related to the USAF
Global Positioning System (GPS) and other satellite navigation positioning
systems. The GPS Digest is moderated and is not presently available via
USENET newsgroup. Submissions should be made to gps@tws4.si.com.
Administrative requests [including requests to be added to the mailing
list] should be made to gps-request@tws4.si.com.
The digests are archived in the CANSPACE file archives.

o GPStech
The GPStech Mailing List
| Operated by Jeff Freymueller, Department of Geophysics, Stanford University

| GPStech is an unmoderated mailing list for the discussion of GPS technical
| and other issues. The intention is to provide a forum for the exchange of
| information, for discussion of the finer technical points that always seem
| to trip us up, and for questions about particular GPS analysis software.

| While the original intent of the list was to provide a forum for discussion
| of topics involved in high-precision geodetic GPS (for surveying and

| crustal deformation applications), topics involving GPS navigation are
| welcomed as well.

| Both question-and-answer and open debate/discussion are encouraged. New
| members are encouraged to ask questions and suggest topics of discussion
| (as are longtime members for that matter).

Use the following mail addresses to access the GPStech list:

gpstech@cotopaxi.stanford.edu -- to post a message
gpstech-request@cotopaxi.stanford.edu -- to join or quit the list

USENET
Several USENET news groups have occasional postings related to GPS. Among
them are
o comp.infosystems.gis (gatewayed with the LISTSERV list
GIS-L@UBVM.CC.BUFFALO.EDU)
o rec.aviation.misc
o rec.boats
| o sci.electronics
o sci.space
o sci.space.news
| A new USENET news group, sci.geo.satellite-nav, has recently been established.

3. PERIODICALS

GPS WORLD MAGAZINE
o Monthly magazine covering the spectrum of GPS usage
o Current regular subscription rates: US $59, Canada $79, Foreign $117
o Special subscription rates may be offered from time to time
o Free subscriptions may still be available for qualified individuals
o Advanstar Communications
P.O. Box 10460
Eugene, Oregon 97440-2460
U.S.A.
Phone: (503) 343-1200
Fax: (503) 683-8841
Telex: 510-597-0365

GPS WORLD NEWSLETTER
o 6-page newsletter published twice a month by Advanstar Communications
o For subscription information, contact GPS World at the address and phone
numbers above

GPS REPORT
o 8-page newsletter containing news and analysis on commercial and military
applications of GPS
o Also available electronically via NewsNet and Predicasts
o Phillips Business Information, Inc.
7811 Montrose Road
Potomac, MD 20854
U.S.A.

Phone: (301) 340-2100
Fax: (301) 424-4297
Telex: 358149

CSTG GPS SUBCOMMISSION'S GPS BULLETIN
o Bulletin of the GPS Subcommission under Commission VIII, International Coordination of Space Techniques for Geodesy and Geodynamics of the International Association of Geodesy and the International Union of Geodesy and Geophysics
o Reports on GPS developments related to high accuracy uses of GPS
o Status of the Cooperative International GPS Network (CIGNET)
o GPS Bulletin is prepared and distributed by the National Geodetic Survey, National Oceanic and Atmospheric Administration, U.S. Department of Commerce
o Editor: Miranda Chin
NOAA, N/OES13
1305 East-West Highway
Silver Springs, MD 20910
Phone: (301)713-2852
Fax: (301) 713-4475
e-mail: miranda@gracie.grdl.noaa.gov
o According to a report received on 9 November 1993, the GPS Bulletin is no longer being published.

GNSS UPDATE
o Irregular publication of Transport Canada's Global Navigation Satellite System Working Group
o Editor: Deborah Martin
Transport Canada
Place de Ville, Tower "C"
Ottawa, Ontario
K1A 0N8
Attention: AANDDB
Fax: (613) 998-7416

SATNAV NEWS
o Quarterly publication on developments at the Federal Aviation Administration's Satellite Program Office
o Available in electronic form from the CANSPACE file archives (see above)

4. BOOKS AND MONOGRAPHS

Ackroyd, N. and R. Lorimer (1990). Global Navigation, A GPS User's Guide. Lloyd's of London, 202 pp.

ARINC Research Corporation (1991). System Specifications for Navstar GPS Space Segment/Navigation Users Interface. GPS Interface Control Document. ICD-GPS-200, 3 July, 115 pp.

| Dahl, Bonnie (1994?). The Users Guide to GPS. Richardsons' Marine
| Publishing, Chicago, IL.

| Geodetic Survey Division, Natural Resources Canada (1993). GPS Positioning
| Guide. Natural Resources Canada, 615 Booth Street, Ottawa, Ontario K1A 0E9

Hofmann-Wellenhof, B., H. Lichtenegger, and J. Collins (1992). Global Positioning System, Theory and Practice. Springer-Verlag, 326 pp.

Institute of Navigation, The (1980). Global Positioning System. Vol. I. Collected reprints of papers published in Navigation. The Institute of Navigation (U.S.), 246 pp.

Institute of Navigation, The (1984). Global Positioning System. Vol. II. Collected reprints of papers published in Navigation. The Institute of Navigation (U.S.), 257 pp.

Institute of Navigation, The (1986). Global Positioning System. Vol. III. Collected reprints of papers published in Navigation. The Institute of Navigation (U.S.), 293 pp.

King, R.W., E.G. Masters, C. Rizos, A. Stolz, and J. Collins (1985). Surveying with GPS. Monograph 9. School of Surveying, The University of New South Wales, Kensington, New South Wales, Australia.

Leick, A. (1990). GPS Satellite Surveying. John Wiley and Sons, Inc., New York, Toronto, 352 pp.

Logsdon, T. (1992). Navstar Global Positioning System. Van Nostrand Reinhold, New York, 249 pp.

McElroy, S., E. Masters, G. Jones, D. Kinlyside, C. Rizos, A. Sivertsen, P. Brown, O. Moss, and G. Dickson (1992). Getting Started with GPS Surveying. The Global Positioning Consortium (GPSCO), c/o School of Surveying, The University of New South Wales, Kensington, New South Wales, Australia, 186 pp.

Puterski, R., J.A. Carter, M.J. Hewitt, H.F. Stone, L.T. Fisher, and E.T. Slonecker. (1992). GIS Technical Memorandum 3: Global Positioning Systems Technology and its Application in Environmental Programs. EPA/600/R-92/036. Environmental Monitoring Systems Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, P.O. Box 93478, Las Vegas, NV 89193-3478, 68 pp.

| Radio Technical Commission for Maritime Services Special Committee 104 (1994).
| RTCM Recommended Standards for Differential Navstar GPS Service, Version 2.1
| (RTCM Paper 194-93/SC104-STD). RTCM, P.O. Box 19087, Washington, D.C. 20036.

Seeber, G. (1993). Satellite Geodesy: Foundations, Methods, and Applications. Revised translation of Satellitengeodasie. Walter de Gruyter & Co., Berlin, 531 pp.

Trimble Navigation, Ltd. (1989). GPS: A Guide to the Next Utility. Trimble Navigation Ltd., Sunnyvale, California., 76 pp.

Trimble Navigation, Ltd. (1992). GPS Surveyor's Field Guide -- A Field Guidebook for Static Surveying. Trimble Navigation Ltd., Sunnyvale, California.

Trimble Navigation, Ltd. (1992). GPS Surveyor's Field Guide -- A Field Guidebook for Dynamic Surveying. Trimble Navigation Ltd., Sunnyvale, California, 72 pp.

Trimble Navigation, Ltd. (1993). Differential GPS Explained -- An expose of the surprisingly simple principles behind today's most advanced positioning technology. Trimble Navigation Ltd., Sunnyvale, California, 55 pp.

| United States Army Corps of Engineers (1991). NAVSTAR Global Positioning
| System Surveying. Engineer Manual No. 1110-1-1003. Department of the Army,
| U.S. Army Corps of Engineers, Washington, D.C. 20314-1000.

Wells, D.E., N. Beck, D. Delikaraoglou, A. Kleusberg, E.J. Krakiwsky, G. Lachapelle, R.B. Langley, M. Nakiboglu, K.P. Schwarz, J.M. Tranquilla, and P. Vanicek (1987). Guide to GPS Positioning. 2nd printing with corrections. Canadian GPS Associates, Fredericton, New Brunswick, Canada, 600 pp.

Many of these books are available from

Navtech Book and Software Store (a division of Navtech Seminars, Inc.)
2775 S. Quincy St.
#610
Arlington, VA 22206-2204
U.S.A.
Phone: (800) 628-0885
(703) 931-0500
Fax: (703) 931-0503

5. PAPERS AND ARTICLES

A series of six articles on GPS receivers (primarily the transputer-based receivers developed by Inmos) by Philip Mattos, a consulting engineer with Inmos/SGS-Thomson, was published by Electronics World + Wireless World between December 1992 and May 1993. In addition to receiver details, the articles also cover the theory of operation of GPS, GPS antennas, and various GPS applications. Note that the constructional kit and newsletter mentioned in the sixth article are not available and that there are some minor errors here and there scattered through the articles.

Mattos, P. (1992). GPS. Electronics World & Wireless World, No. 1681, pp. 982-987.

Mattos, P. (1993). GPS 2: Receiver Architecture. Electronics World & Wireless World, No. 1682, pp. 29-32.

Mattos, P. (1993). GPS 3: The GPS Message On The Hardware Platform. Electronics World & Wireless World, No. 1683, pp. 146-151.

Mattos, P. (1993). GPS 4: Radio Architecture. Electronics World & Wireless World, No. 1684, pp. 210-216.

Mattos, P. (1993). GPS 5: The Software Engine. Electronics World & Wireless World, No. 1685, pp. 296-&.

Mattos, P. (1993). GPS 6: Applications. Electronics World & Wireless World, No. 1686, pp. 384-389.

6. GPS BIBLIOGRAPHY

A GPS Bibliographic Subscription Service is offered by Canadian GPS Associates, publishers of the Guide to GPS Positioning. This service provides twice-yearly updated editions, listing GPS-related publications from journals, newsletters, reports, and proceedings of GPS-related conferences.

The Premier Edition, issued in late 1992, contained 4,358 entries. This grew from a 1,000-entry bibliography prepared in 1989 at the University of New Brunswick for the U.S. Army Corps of Engineers (Dredging Research Program Technical Report DRP-92-2, available in electronic form as message #5296 on the U.S. Coast Guard's GPS Information Center Bulletin Board). At 8,802 entries, the July 1993 Edition has doubled in size.

The GPS Bibliography is available in both hard-copy and computer-readable form on PC or Macintosh diskettes. The PC diskette version is available in either the standard CSV (comma-separated-variables) text format, or dBase III format. For Macintosh users, the format is tab-separated field text format.

For further information, contact

Canadian GPS Associates
P.O. Box 3184
Postal Station B
Fredericton, New Brunswick
Canada E3A 5G9
Phone: (506) 454-2650
Fax: (506) 454-0352
e-mail: lang@unb.ca

7. GPS RECEIVER SURVEYS

| Fishing & Powerboat Electronics Buyers Guide. Includes test reports, quality
| ratings, and best buy selections of GPS receivers (and other electronic
| boating equipment). Annual publication. Available at news-stands. Published
| by Skipper Marine Electronics, Inc., 3170 Commercial Avenue, Northbrook, IL
| 60062; (708) 272-4700, (800) 754-7737.

GPS Receiver Survey. Published by Navtech Seminars, Inc. (see above for address). Updated frequently.

GPS World Receiver Survey. Published annually in the January issue of GPS World magazine.

Guide to GPS Receivers. Published irregularly by Colwell-Kirtland International, 675 Almanor Avenue, Sunnyvale, CA 94086; (408) 720-0111.

Who's Who in GPS Equipment -- A Technical Reference. Published by Phillips Business Information, Inc., publishers of GPS Report (see above for address). Annual publication.

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Geodetic Research Laboratory BITnet: LANG@UNB or SE@UNB
Dept. of Geodesy and Geomatics Engineering Phone: (506) 453-5142
University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
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464. EME contest scheduling

Newsgroup: rec.radio.amateur.space
Date: 1994-04-03 17:39:49 UTC
From: broz@csn.org
Message-ID: <199404031739.AA27700@teal.csn.org>
Source record: 27818

About a week ago someone (I believe it was a G) posted a detailed analysis for the optimum weekends for the EME contests, based not only on visibility and S/N ratio, but also on European contest conflicts. I seem to have erased that day's email and would like to receive another copy if someone could be so kind. The scheduling has become a minor topic on the contest reflector and I wanted to be up on all of the issues.

Thanks in advance. John W0UN broz@csn.org

(On EME myself, but only at HF! Have gotten excellent echoes on 10M with a 32 element array and fair (at best) echoes on 15M with a 28 element array.)

465. ANS-092 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-04-03 18:13:58 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-092.01.1994@ampr.org>
Source record: 27819
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-092.01
AMSAT-OE SPONSORS SEMINAR

HR AMSAT NEWS SERVICE BULLETIN 092.01 FROM AMSAT HQ
SILVER SPRING, MD APRIL 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-092.01

AMSAT-Austria Sponsors Space Education Seminar 16-APR-1994 In Innsbruck

The AMSAT-Austria group (AMSAT-OE) will announce their first Educational Development Seminar meeting using the amateur radio satllites AO-21 and DOVE (DO-17). It is most fitting that these satellites will be used to broadcast the announcement of this meeting because the theme is the advancement science education through use and observation of OSCARs. Look for the announcement from DOVE beginning on 15-APR-1994 in its telemetry broadcasts and look for the synthesized voice message from AO-21 this week.

The meeting will take place on 16-APR-1994 at the Technical Highschool of Innsbruck, Austria and is being sponsored by the Department of Electronics and Telecommunication. The presenters planned will be OE1VKW, DG2CV, and EA2CLS/KB7HTA, and I2KBD. All of these radio amateurs are well know in educational circles. They have a lot of interesting information for those in attendence. All are invited to join AMSAT-OE at this seminar. For more information, contact Wolf Hoeller (OE7FTJ) at his INTERNET address of uibk.ac.at.

[The AMSAT News Service would like to thank Wolf Hoeller (OE7FTJ) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-092.02
OPERATING TIPS FOR AO-27

HR AMSAT NEWS SERVICE BULLETIN 092.02 FROM AMSAT HQ
SILVER SPRING, MD APRIL 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-092.02

N8QGC & N4TPY Offer Some Operating Suggestions For AMRAD-OSCAR-27 (AO-27)

N8GQC has been working staions on AO-27 all the way from his Detroit area QTH to as far away as Mexico City, Mexico, Baffin Island, and the North West Teritories. He notes that these are great contacts for a Low Earth Orbiting (LEO) satellite. In his discussions with the AO-27's ground control station station operator N4TPY, N8GQC has put together a list of "good

operating practices" that N4TPY would like all those who use AO-27 to follow:

1. Please use as little power as possible. It is recommended that you use your H/T when possible. If not, then use no more then 25 Watts ERP.

2. Please try to be kind to other satellite operators. The object should be to make as many contacts as you can, and to step on as few as possible.

3. The satellite has no set schedule of availability at this time. The control stations will make it available only on weekends during daylight passes. Sometimes during the week AO-27 may also be on, but it will be "hit or miss."

N8QGC has worked AO-27 with a very simple set up. He transmits on the uplink frequency of 145.850 MHz using a homebrew 1/4 wave vertical antenna. His total uplink power is 10 watts. N8GQC find that this gives him a very strong signal into the satellite. But he especially wants hams to know that he has also worked AO-27 using a H/T with a "rubber-duck" antenna and 2.5 watts output! However, receiving this satellite can be somewhat difficult. N8QGC uses a KLM 440-6X antenna to receive. This is the the same 6 element UHF YAGI that he uses for transmitting on AO-21 when he isn't communicating through AO-27. AO-27's downlink can be heard on on 436.800 MHz. N8QGC is in the process of experimenting with several different receiving antennas. For mobile operations using AO-27 he has tried using his full-wave 70CM antenna on the car but has noted that doesn't work very well. On the receive side, he reports, it still takes a 6 element Yagi antenna.

By keeping the above suggestions in mind, all users of AO-27 will be able to enjoy it to its fullest capabilities.

[The AMSAT News Service would like to thank N8GQC & N4TPY for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-092.03
SATELLITE W.A.E.Z.S. AWARD

HR AMSAT NEWS SERVICE BULLETIN 092.03 FROM AMSAT HQ
SILVER SPRING, MD APRIL 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-092.03

Worked All European Zones by Satellite (W.A.E.Z.S.) Award Available

AO-10 and AO-13 user Mario Di Iorio (IW6BNC) is active from his QTH in Macerata located in the center of Italy, grid square JN63RH. Mario is also the manager of W.A.E.Z.S (Worked All European Zones by Satellite) Award. Mario reports that very few radio amateurs know of the existence of this award. The European zones are: 14, 15, 16, 20, and 40. The award is divided

into a bronze, silver, and gold award. The follwing is the criteria for each catagory:

1) The basic award or the "Bronze" award can be obtained with a single QSO with any radio amateur station in Macerata, Italy and 3 European zones.

2) The "Silver" award can be obtained with making contacts with 4 European zones and 1 operator from Macerata, Italy.

3) The "Gold" award can be obtained with 5 European zone contacts plus one contact from any station in Macerata, Italy.

The follwoing are the only valid amateur radio operators from Macerata. And they are are: 1) IK6LMB, 2) IW6BNC, 3) IK6MQM. Send your requests for this award to:

W.A.E.Z.S AWARD MANAGER
c/o A.R.I. MACERATA
P.O. BOX 66
62100 MACERATA - MC ITALY

and please include 10 IRCs.

The orginal QSL cards are not needed as proof of confirmation of the contacts but only a list of QSOs containing all the details of the contacts between the stations involved. This award is valid for a single satellite but it changes with respect to the different modes of operation, e.g., SSB, CW or a mix of the the two modes. IW6BNC hopes to see many stations striving to obtain the W.A.E.Z.S award. If you have further questions about this award and its rules, direct your inquiries to:

Mario Di Iorio (IW6BNC)
P.O. Box 66
62100 Macerata - MC
Italy

Or you can send IW6BNC a packet message to his local packet radio BBS of IW6BNC @ IW6BET.MC.ITA.EU.

/EX
SB SAT @ AMSAT $ANS-092.04
LATEST ZRO TEST NOTES

HR AMSAT NEWS SERVICE BULLETIN 092.04 FROM AMSAT HQ
SILVER SPRING, MD APRIL 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-092.04

WA5ZIB Offers The Some Observations On The Recent AO-13 ZRO Tests

The current round of ZRO Tests via AO-13 are complete. No tests were missed and all went well. Some interference was experienced on the Feb-ruary 19th test, but it was not critical. The tests of February 19th and

26th were completed just prior to AO-13's switch to Mode "S" with no time available for discussion with participants after the tests. These ZRO tests were scheduled very close to the mode-switch time due to a minor error in predictions made months in advance. The February 26th test was begun a few minutes early to ensure that all levels would be sent prior to mode switch. Many thanks to those on the AO-13 AMSAT Operations Net that identified the potential schedule conflict before it became a problem.

No new Z9 reports have yet been received, but there's plenty of time to send in submissions. There is no charge for copy verification although an S.A.S.E. is appreciated. Send your copy to: Andy MacAllister (WA5ZIB), AMSAT V.P. User Services, 14714 Knights Way Drive, Houston, TX 77083-5640.

More tests will be scheduled during the next season of Nadir pointing for AO-13. The dates will be posted to the AMSAT News Service (ANS).

/EX
SB SAT @ AMSAT $ANS-092.05
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 092.05 FROM AMSAT HQ
SILVER SPRING, MD APRIL 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-092.05

Weekly OSCAR Status Reports: 02-APR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Mar 19-Apr 04
Mode-B : MA 0 to MA 90 |
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 |
Omnis : MA 230 to MA 30 | Move to attitude 235/0, Apr 04 240/0, Apr 04
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
6-Apr-94 6:45 -to- 13-Apr-94 7:10 UTC
20-Apr-94 7:35 -to- 27-Apr-94 7:55 UTC
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-21: N8QGC has been working AO-21 from Detroit QTH and notes that AO-21 is operating normally. It is on the following schedule: 5 minutes of FM repeater operation followed by 4 minutes of WEFAX transmissions. Finally, the cycle is conclued with 1 minute of packet before switching back to FM repeter mode. [N8QGC]

AO-27: AO-27 now acting as a 'J' mode FM transponder and is proving very popular in Europe, with increased activity daily. It has a strong excellent quality downlink that can easily be heard on a hand-held receiver on 436.800 MHz +/- some 10 KHz of shift Doppler shift correction. It's sensitivity is far greater than 'B' Mode on AO-21. If there are no QRO stations on 145.850 MHz (+/- some 3 KHz of Doppler shift), uplinking using a hand-held which can produce 2 watts ERP is capable of putting an excellent full quieting signal into the transponder. As evidence G3IOR has worked several other European stations using 2.5 watt hand-held dual-band transceivers and for optimum footprint coverage to VE8DX who was running just 3 watts into a ground plane omni-directional from Baffin Island. All were fully quieting signals! [G3IOR]

STS-59: A brief reminder that STS-59 is scheduled to be launched on 07-APR-94 at 12:07 UTC and will carry the Shuttle Amateur Radio Experiment (SAREX) payload. For complete details, please refer back to the $ANS-071.02 bulletin.

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

466. HELP: My Satellite Tracking Program Won't Work

Newsgroup: rec.radio.amateur.space
Date: 1994-04-03 19:54:03 UTC
From: benjie@hip-hop.hh.sbay.org
Message-ID: <2nn6sr$uso@hip-hop.hh.sbay.org>
Source record: 27820
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc,sci.space,sci.space.tech

Hello,

I downloaded the program sattrack for my UNIX box at home and compiled
it under linux. Everything went okay until I tried the program. The
program kept on telling me that the satellites have "crashed already".

I tried AO-21, Mir and Oscar 13, they all gave me the same result, and
I know, for a fact, that the satellites have not been crashed :-).

Please help me, thanks in advance.

73 de KE6BCU, Benjie

-------here are the scripts I used and the results I got back---------------

Here are the lines I used for AO-21:

```
AO-21
1 21087U 91006A 94069.83595116 .00000094 00000-0 82657-4 0 4439
2 21087 82.9370 215.4726 0036191 0.5572 359.5617 13.74535665156075
```

Here is the line I used for Sunnyvale CA in the sites.dat file

```
Sunnyvale CA 37.283333 122.200000 50.0
```

And here is what I got from the program, running "sattrack -v"

```
wales{benjie}41: sattrack -v

SatTrack V1.0

Ground station : Sunnyvale CA
Satellite : AO-21
Element set : tle
Element set type : NASA
Time zone : PST (-8)
Duration : 5.0 d
Min elevation : 48.0 deg

Ground station < Sunnyvale CA> : Sunnyvale CA

Ground station : Sunnyvale CA
Latitude : 1.000000 deg N
Longitude : 48.000000 deg W
Altitude : -49.000000 m

Satellite name < AO-21> : AO-21
Two-line elements < tle> : tle
```

```
AO-21
1 21087U 91006A 94069.83595116 .00000094 00000-0 82657-4 0 4439
2 21087 82.9370 215.4726 0036191 0.5572 359.5617 13.74535665156075

Satellite name : AO-21
Satellite number : 21087
Element set : 443
Epoch : 94008.000000000 d 08-01-94 00:00:00.000 UTC
Mean anomaly : 4.000000000 deg
Arg of perigee : 0.000000000 deg
RAAN : 4.000000000 deg
Inclination : 3.000000000 deg
Eccentricity : 0.003619100
Mean motion : 8.000000000 rev/d
Decay rate : 8.000000000 rev/d^2
Orbit : 15607

Display Prediction Restart Quit <D> ? d
SatTrack KE6BCU
AO-21 TRACKING MONITOR

Ground Stn : Sunnyvale CA Date: __-__-__ Radio Beacon : 146.000 MHz
Satellite : AO-21 Day : ___ ___ Doppler Shift: -__.___ kHz
Inclination: 3.000 deg UTC : __:__:__ Path Loss : ___.___ dB
Orbit : _____ ___._ % _ PST : __:__:__ Phase (0-256): ___.___
Sun Azi/Ele: ___._ -__._ deg Mode (ABJLS): __

Azimuth : ___.___ deg Latitude N : -__.___ deg
Elevation : -__.___ deg Longitude W : -___.___ deg
Range : _____.___ km Height : _____.___ km
Range Rate: -__.___ km/s Velocity : _____.___ km/s

State Vector X: -_____.___ km Y: -_____.___ km Z: -_____.___ km
VX: -_____.___ km/s Y: -_____.___ km/s Z: -_____.___ km/s

Next AOS : ___/__:__:__ PST AOS Azimuth : ___.___ deg _
Duration : ___/__:__:__ MEL Azimuth : ___.___ deg _
Next LOS : ___/__:__:__ PST LOS Azimuth : ___.___ deg _
Countdown : ___/__:__:__ Max Elevation: __.___ deg

Satellite has crashed already!

--
Benjie Chen benjie@hh.sbay.org benjie@wales.sbay.org
KE6BCU@N0ARY.#NOCAL.CA.USA.NOAM KE6BCU on the air / 147.315 +.600 pl151.4
Join Internet Amateur Mathematics Society. Email listserv@hh.sbay.org with
"FAQ iams" in the body of the message.
```

467. HELP: my satellite program won't work

Newsgroup: rec.radio.amateur.space
Date: 1994-04-03 22:41:09 UTC
From: benjie@hh.sbay.org
Message-ID: <2nngm5$856@hip-hop.hh.sbay.org>
Source record: 27821
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc,sci.space

Sorry if you got a duplication, I had a little problem posting to the net.

Anyway, I downloaded the program sattrack for my UNIX box at home and compiled it under linux. Everything went okay until I tried the program. The program kept on telling me that the satellites have "crashed already".

I tried AO-21, Mir and Oscar 13, they all gave me the same result, and I know, for a fact, that the satellites have not been crashed :-).

Please help me, thanks in advance.

73 de KE6BCU, Benjie

-------here are the scripts I used and the results I got back---------------

Here are the lines I used for AO-21:

```
AO-21
1 21087U 91006A 94069.83595116 .00000094 00000-0 82657-4 0 4439
2 21087 82.9370 215.4726 0036191 0.5572 359.5617 13.74535665156075
```

Here is the line I used for Sunnyvale CA in the sites.dat file

```
Sunnyvale CA 37.283333 122.200000 50.0
```

And here is what I got from the program, running "sattrack -v"

```
wales{benjie}41: sattrack -v

SatTrack V1.0

Ground station : Sunnyvale CA
Satellite : AO-21
Element set : tle
Element set type : NASA
Time zone : PST (-8)
Duration : 5.0 d
Min elevation : 48.0 deg

Ground station < Sunnyvale CA> : Sunnyvale CA

Ground station : Sunnyvale CA
Latitude : 1.000000 deg N
Longitude : 48.000000 deg W
Altitude : -49.000000 m
```

```
Satellite name < AO-21> : AO-21
Two-line elements < tle> : tle

AO-21
1 21087U 91006A 94069.83595116 .00000094 00000-0 82657-4 0 4439
2 21087 82.9370 215.4726 0036191 0.5572 359.5617 13.74535665156075

Satellite name : AO-21
Satellite number : 21087
Element set : 443
Epoch : 94008.000000000 d 08-01-94 00:00:00.000 UTC
Mean anomaly : 4.000000000 deg
Arg of perigee : 0.000000000 deg
RAAN : 4.000000000 deg
Inclination : 3.000000000 deg
Eccentricity : 0.003619100
Mean motion : 8.000000000 rev/d
Decay rate : 8.000000000 rev/d^2
Orbit : 15607

Display Prediction Restart Quit <D> ? d
SatTrack KE6BCU
AO-21 TRACKING MONITOR

Ground Stn : Sunnyvale CA Date: __-__-__ Radio Beacon : 146.000 MHz
Satellite : AO-21 Day : ___ ___ Doppler Shift: -__.___ kHz
Inclination: 3.000 deg UTC : __:__:__ Path Loss : ___.___ dB
Orbit : _____ ___._ % _ PST : __:__:__ Phase (0-256): ___.___
Sun Azi/Ele: ___._ -__._ deg Mode (ABJLS): __

Azimuth : ___.___ deg Latitude N : -__.___ deg
Elevation : -__.___ deg Longitude W : -___.___ deg
Range : _____.___ km Height : _____.___ km
Range Rate: -__.___ km/s Velocity : _____.___ km/s

State Vector X: -_____.___ km Y: -_____.___ km Z: -_____.___ km
VX: -_____.___ km/s Y: -_____.___ km/s Z: -_____.___ km/s

Next AOS : ___/__:__:__ PST AOS Azimuth : ___.___ deg _
Duration : ___/__:__:__ MEL Azimuth : ___.___ deg _
Next LOS : ___/__:__:__ PST LOS Azimuth : ___.___ deg _
Countdown : ___/__:__:__ Max Elevation: __.___ deg

Satellite has crashed already!

--
Benjie Chen benjie@hh.sbay.org benjie@wales.sbay.org
KE6BCU@N0ARY.#NOCAL.CA.USA.NOAM KE6BCU on the air / 147.315 +.600 pl151.4
Join Internet Amateur Mathematics Society. Email listserv@hh.sbay.org with
"FAQ iams" in the body of the message.
```

468. SatTrack

Newsgroup: rec.radio.amateur.space
Date: 1994-04-04 20:34:41 UTC
From: HEAGYWS@ctrvax.Vanderbilt.Edu
Message-ID: <1994Apr4.203441.4071@news.vanderbilt.edu>
Source record: 27822

I'm sorta new to this sat. tracking stuff but am trying to get a
handle on it. A friend gave me a shareware copy of SatTrack to
try out. The data file seems very old. Does anyone know where
I could get up to data data files for SatTrack?

Thanks...Win
heagyws@ctrvax.vanderbilt.edu

469. ARLK013 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-04-04 22:07:45 UTC
From: owner-w1aw-list@netcom.com
Message-ID: <$arlk013.1994@ampr.org>
Source record: 27823
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK013
ARLK013 Keplerian data

ZCZC SK80
QST de W1AW
Keplerian Bulletin 13 ARLK013
From ARRL Headquarters
Newington, CT April 2, 1994
To all radio amateurs

SB KEP ARL ARLK013
ARLK013 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94090.04857020 -.00000126 10000-3 0 2726
2 14129 27.1828 334.6164 6021586 166.4731 222.3171 2.05878019 53208
RS-10/11
1 18129U 87054 A 94087.86953292 0.00000048 35789-4 0 8858
2 18129 82.9247 28.2040 0010048 247.5026 112.5060 13.72333957338899
UO-11
1 14781U 84021 B 94088.54614116 0.00000310 60435-4 0 6771
2 14781 97.7907 106.9891 0011724 159.5745 200.5932 14.69179967538610
RS-12/13
1 21089U 91007 A 94087.91832396 0.00000073 62203-4 0 6753
2 21089 82.9180 70.9759 0029421 335.5442 24.4319 13.74038100157622
AO-13
1 19216U 88051 B 94089.57476926 -.00000405 10000-4 0 8978
2 19216 57.8673 260.4952 7210521 338.0957 2.2906 2.09726187 12866
UO-14
1 20437U 90005 B 94089.78002368 0.00000055 38442-4 0 9774
2 20437 98.5902 175.6151 0011994 63.2614 296.9794 14.29833748218380
AO-16
1 20439U 90005 D 94089.20880979 0.00000052 37099-4 0 7777
2 20439 98.6002 176.2024 0012329 65.1942 295.0533 14.29888159218318
DO-17
1 20440U 90005 E 94089.24080620 0.00000063 41255-4 0 7768
2 20440 98.5996 176.5305 0012438 64.3153 295.9310 14.30027317218339
```

```
WO-18
1 20441U 90005 F 94090.19431294 0.00000051 36697-4 0 7785
2 20441 98.6012 177.4806 0013046 61.5324 298.7177 14.30002526218473
LO-19
1 20442U 90005 G 94089.26815097 0.00000060 40132-4 0 7766
2 20442 98.6013 176.8020 0013338 63.8292 296.4260 14.30097329218359
FO-20
1 20480U 90013 C 94089.46791516 -.00000026 82466-5 0 6723
2 20480 99.0274 256.2045 0541263 157.7469 204.8111 12.83224806194031
AO-21
1 21087U 91006 A 94090.36347229 0.00000093 82657-4 0 4495
2 21087 82.9445 200.2890 0034231 302.9738 56.8128 13.74536481158891
UO-22
1 21575U 91050 B 94088.19621400 0.00000082 42436-4 0 4781
2 21575 98.4399 164.2896 0007602 162.2933 197.8526 14.36902851141598
KO-23
1 22077U 92052 B 94089.40023487 -.00000037 10000-3 0 3734
2 22077 66.0807 84.9415 0012132 306.9711 53.0198 12.86285590 76650
KO-25
1 22830U 93061 H 94089.19391177 0.00000061 41952-4 0 2772
2 22830 98.5601 163.8935 0012606 49.5068 310.7222 14.28043381 26423
IO-26
1 22826U 93061 D 94090.21670618 0.00000050 37923-4 0 2740
2 22826 98.6600 166.8192 0010132 76.2498 283.9812 14.27718516 26561
AO-27
1 22825U 93061 C 94090.23004933 0.00000064 43978-4 0 2744
2 22825 98.6599 166.8062 0009628 75.4070 284.8171 14.27615820 26560
PoSat
1 22829U 93061 G 94089.68812903 0.00000066 44108-4 0 2679
2 22829 98.6555 166.3095 0011064 65.4928 294.7409 14.28014942 26490
STS-59
1 99959U 94097.74947238 0.00221188 11303-3 0 76
2 99959 57.0053 276.3038 0009259 269.9963 90.0094 16.19806752 53
Mir
1 16609U 86017 A 94090.25081547 0.00008348 11343-3 0 5496
2 16609 51.6462 216.9197 0015558 91.3363 268.9434 15.58441517493803

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
April 5, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

470. Az/El Rotator suggestions wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-04-04 22:22:11 UTC
From: debaker@bnr.ca
Message-ID: <2nq3uj$4rf@crchh7b0.bnr.ca>
Source record: 27824

Hello,

I am looking for suggestions on homebrewed or inexpensive az/el
combos. I have looked at the kilobuck stuff from Yeasu and similiar
makers, but am wondering if there are any kits or ideas for cheaper
construction. I have read just about every satellite publication,
so I have already seen a lot. I am trying to identify any designs
that use inexpensive rotators (like the R/S TV rotator), and gear
them down and perhaps modify them for greater than 360 degree rotation
in order to get better weight loading and granularity in adjustment.
If anyone knows of any ideas or plans (or knows about the R/S rotator),
please let me know.

Thanks,
+---+
| David E. Baker Internet: debaker@bnr.ca (Richardson, TX, USA) |
| Callsign: AB5PI Amateur Packet: AB5PI@N5AUX.#DFW.TX.USA.NA |
| My opinions do not necessarily reflect the opinions of my employer |
+---+

471. STS-59 SAREX Mission Delay

Newsgroup: rec.radio.amateur.space
Date: 1994-04-05 01:32:05 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.001.1994@ampr.org>
Source record: 27825
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.001
STS-59 Mission Delay

The STS-59 SAREX mission has been delayed 24 hrs due to some extra inspections that need to be performed at the launch site. Tentative launch will be on April 8 at 12:07 UTC.

A new set of Keplerian Elements will be provided in the near future.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

472. STS-59 Element Set (94098.748)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-05 14:30:35 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94098.748@alsys.com>
Source record: 27826
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 00059U 94098.74878017 .00221188 00000-0 11303-3 0 80
2 00059 57.0053 277.0416 0009259 269.9963 90.0094 16.19806752 54

Satellite: STS-59
Catalog number: 00059
Epoch time: 94098.74878017 = (08 APR 94 17:58:14.61 UTC)
Element set: 008
Inclination: 57.0053 deg
RA of node: 277.0416 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-008
Arg of perigee: 269.9963 deg Launch: 08 APR 94 12:06 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
```

473. best 2m lin/circ antenna

Newsgroup: rec.radio.amateur.space
Date: 1994-04-06 14:47:14 UTC
From: thooker@psl.nmsu.edu
Message-ID: <thooker.31.000EC9FB@psl.nmsu.edu>
Source record: 27830

I am looking to buy a very hi quality, 2m beam antenna. I would like something better than Cushcraft. I will be purchasing a crossed YAGI, but desire to operate only one polarization at a time, ie horizontal (for ssb) or vertical (for FM). Bandwidth needs to be entire 2m band.

I will need to remove the matching / phasing network and use to feedlines, feeding one set of elements at a time to achieve linear pol.

I have got price quotes on M squared and KLM antennas, but I have never seen the actual mechanical construction used in these brands. My QTH is in a high wind envionment, and I desire to have the connections to the elements enclosed (as I believe the M squared is).

Any info will be appreciated.
T. Hooker email: Thooker@PSL.NMSU.EDU
KA5ECS

474. SPACE STATION SYSTEM DESIGN REVIEW COMPLETED

Newsgroup: rec.radio.amateur.space
Date: 1994-04-06 16:17:59 UTC
From: postmaster@asarin.ORG.AR
Message-ID: <gate.ocqDkc1w165w@asarin.org.ar>
Source record: 27827

SPACE STATION SYSTEM DESIGN REVIEW COMPLETED

Mark Hess
Headquarters, Washington, D.C.
March 24, 1994

Kari Fluegel
Johnson Space Center, Houston

RELEASE: 94-53

Plans for the International Space Station are maturing rapidly and the orbiting research facility is on track for assembly to begin in 1997 as scheduled, program managers said today after completion of the system design review.

"This was a major milestone for the International Space Station," said Space Station Director Wilbur Trafton. "The space station team has just conducted a comprehensive review of the requirements, configuration and the maturity of the station's technical definition. We now have a solid baseline for the program. We have an executable schedule with costs that maintain acceptable reserves within our budget cap."

A major milestone in the space station program, the system design review (SDR), included participants from NASA, the Canadian Space Agency, the European Space Agency, the Italian Space Agency, the Japanese Space Agency, the Russian Space Agency, the prime contractor Boeing and Tier I subcontractors Rocketdyne and McDonnell Douglas.

Managers reviewed and evaluated the overall configuration, technical requirements and detailed specifications for the space station during the meeting which concluded Wednesday at the Johnson Space Center.

"I'm extremely pleased with the results of this program review," said Program Manager Randy Brinkley. "The results of the SDR demonstrate that the International Space Station has a high degree of design maturity. This program is right on track to providing the science community with a world class orbiting laboratory."

The SDR resulted in a consensus among program managers on the technical validity of the design and completeness of the station's system specifications, the operations concept and requirements for interfaces with the Space Shuttle and Russian launch vehicles. Refinements to cost and program schedules also were presented.

Baseline Configuration

Using approximately 75 percent of Space Station Freedom hardware, the completed International Space Station consists of U.S. elements including the integrated truss, habitation module and laboratory module; the Russian science power platform, service module and functional cargo block vehicle (FGB); the ESA laboratory module; Japanese experiment module and exposed facility and the Canadian remote manipulator system.

The station will operate at an altitude of approximately 240 n.m. (444 km) and will orbit in a 51.6 degree inclination which will offer better Earth observation opportunities. The International Space Station increases crew size from four to six. It will have 33 standard user racks for science operations.

Schedule

The planned assembly of the station will begin with launch of the Russian "FGB" vehicle in November 1997. A docking compartment will be added before the first American launch in December 1997. The Russian service module will be added to the station in January 1998 followed by the universal docking module and the science power platform. The U.S. laboratory module will be launched on the third U.S. flight in May 1998 and will signal the beginning of human-tended science operations.

The Canadian-built robotic arm will be launched on the next flight in June 1998 and the addition of the Soyuz transfer vehicle in August 1998 will provide capabilities for extended on-orbit operations. The Japanese experiment module will be launched in early 2000 and the ESA laboratory module will be added in June 2001. Assembly will be complete in June 2002. In total, the sequence provides for 13 Russian assembly flights and 16 U.S. assembly flights. Use of the Ariane V launcher to lift the European module to the station also has been added to the technical baseline.

Cost

The U.S. contribution to the station is estimated to cost $17.4 billion from Fiscal Year 1994 until assembly is complete in 2002. This includes annual budget appropriations of about $2.1 billion and consists of development, vehicle and ground operations costs and utilization support during the assembly period.

International Partner Status

Canada completed the critical design review for the Space Station remote manipulator system in 1993. Changes in the subsystem design requirement and assembly sequence currently are being addressed.

The critical design review for the Japanese experiment module is scheduled for 1996. Currently all development activities are on track for launch in early 2000. The European attached pressurized module (APM) preliminary design review is scheduled for 1996 with the critical design review scheduled for 1998. Program managers also are investigating the feasibility of launching the APM on an Ariane V booster as a baseline.

The inter-government agreements for the station currently are being amended to include Russia as a full partner. The memorandum of understanding

and joint management plan with Russia will be completed in mid-1994 and negotiation of a fixed price contract is currently in work.

Extravehicular Activities

The amount of extravehicular activity (EVA) in the critical path for station assembly has been significantly reduced. EVA crew hours for maintenance during the station's 10-year operational lifetime also have been significantly reduced.

Ground Control

The ground system for the International Space Station builds on the interfaces for the Shuttle and Freedom programs. The design is being optimized to reduce developmental and recurring costs. All drivers for the ground control systems are well understood and the final specification will be baselined for May.

Station systems

All station systems have a high degree of design maturity. For example, the guidance, navigation and control system design is 97 percent complete. The communications and tracking system design is very mature and analysis and testing to date show that all station requirements will be met. The critical design reviews for the audio, video, S-band and Ku- band systems have been completed with more than 90 percent of the flight material on order or available inhouse. The thermal control system has been significantly simplified. The external active thermal control system has the most significant changes but still retains 40-50 percent of the previous hardware designs.

The internal active thermal control system retains 80-90 percent and the photovoltaic active thermal control system retains 100 percent of the existing hardware design. Also, analysis shows that designs for the life support systems also are progressing well with development programs completed for all major subsystems. A number of key environmental system tests have been completed using prototype hardware and 90 percent of the hardware has passed a critical design review.

Transition Activities

Since the transition activities began last fall, 1,050 open issues from the Freedom program have been resolved. Another 471 new program issues also have been closed during that time. At the close of the SDR, only 17 issues remain open. Those issues include providing for additional on-orbit payload storage, addressing Japanese experiment module and ESA module ventilation noise levels and determining the location and specifications for an optical quality window in the station design.

"We've closed nearly 100 issues for every technical issue still to be resolved and for the few remaining open items, each has a plan on how to close it and a timetable within which it will be closed," Trafton said. "The team is tackling the tough issues, making decisions and moving ahead with a space

station that can be built on schedule and at the cost which the Administration and the Congress have established for this program."

With the completion of the SDR, the space station team will refine the design to more detailed levels. In April 1995, the program will conduct the critical design review for the station, a milestone that means the detailed engineering design essentially will be complete.

"We have come a long way in a short amount of time, and that is due to an unbelievable level of professional dedication and hard work by all the program team members," Brinkley said. "Because of these people, the International Space Station will be on orbit and performing valuable science as the nation and the world enters the next century."

73's de Ed.

@@@ @@@ @@@@@ Eduardo Sweet Biro | postmaster@asarin.org.ar
@ @ @ @ @ |
@@@@@ @@@@@ @ Informatics department director | A mind stretched by a new
@ @ @ @ @ Argentine Inventors Association | idea can never go back to
@ @ @ @ @@@@@ <aai@asarin.org.ar> | its original dimensions.

475. Re: Az/El Rotator suggestions wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-04-06 19:28:23 UTC
From: cbetz@radioman.cray.com
Message-ID: <1994Apr6.142823.28628@ned.cray.com>
Source record: 27828

In article <2nq3uj$4rf@crchh7b0.bnr.ca>, debaker@bnr.ca (David Baker) writes:
>
> Hello,
>
> I am looking for suggestions on homebrewed or inexpensive az/el
> combos. I have looked at the kilobuck stuff from Yeasu and similiar
> makers, but am wondering if there are any kits or ideas for cheaper
> construction. I have read just about every satellite publication,
> so I have already seen a lot. I am trying to identify any designs
> that use inexpensive rotators (like the R/S TV rotator), and gear
> them down and perhaps modify them for greater than 360 degree rotation
> in order to get better weight loading and granularity in adjustment.
> If anyone knows of any ideas or plans (or knows about the R/S rotator),
> please let me know.
>

In general, the elevation mechanism is *difficult* part. If you are willing to do some metal work, you can provide elevation with an actuator arm from a satellite tv dish. Most of these will lift a pretty fair load, but if the array is well balanced, it really doesn't have to lift much at all. You can find these things brand new for as little as $59 (for an 18" arm). If you are willing to go with used stuff, you can probably find them for alot less. If you can find the right tvro dealer, you might be able to get an older used model for free. (One dealer up here told me they just toss them in the garbage. Of course when I told them I was interested they wanted $50).

If you are interested in this method, there is one such setup described in the "SPACE COMMUNICATIONS" section of the newer ARRL handbooks (I think since at least 1991).

The two main disadvantages of this method are you are limited to about 90 degrees or so of elevation, and you will also probably have to build your own position readout system. This method of course will require that you build your own mount. It's not quite as simple as sliding a mast through the rotor, but it can be done alot cheaper.

Charlie Betz N0AKC
Cray Research, Inc. Chippewa Falls, WI

476. Wanted: 2m/70cm Satellite Antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-06 21:21:16 UTC
From: debaker@bnr.ca
Message-ID: <2nv94c$8aa@crchh7b0.bnr.ca>
Source record: 27829
Cross-posted to: rec.radio.amateur.antenna,rec.radio.amateur.space

Hello,

I have been looking into satellite antennas, and it seems that KLM is
the brand of choice...I am interested in hearing from anyone who has
a KLM for sale. All four models (14C, 18C, 22C, 40CX) are of interest.

If you have another brand of satellite antenna for sale, let me know
anyway... A good value is not to be passed up.

Thanks,

```
-------------------------------------------------------------------------
| David E. Baker | Internet: debaker@bnr.ca (Richardson, TX, USA) |
| IP: 47.122.65.7 | UnixID: crchh7b0 | Bell-Northern Research, Inc. |
| Callsign: AB5PI | Packet: AB5PI@N5AUX.#DFW.TX.USA.NA | Smile! ;-) |
| My opinions do not necessarily reflect the opinions of my employer |
|-----------------------------------------------------------------------|
```

477. Re: Motorola GPS engine group purchase update

Newsgroup: rec.radio.amateur.space
Date: 1994-04-07 01:33:48 UTC
From: Dave <hartrum@delphi.com>
Message-ID: <pk+sq2c.hartrum@delphi.com>
Source record: 27831

I just wanted to add my name to the list of people interested in the GPS module purchase. The final price quote will determine if I am in or out, but if the estimated per unit price for the 100 lot is correct it should not be a problem.
Thanks, Dave WA3YDZ
hartrum@delphi.com

478. Satellite Forum Schedule at Dayton?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-07 02:17:16 UTC
From: eac@world.std.com
Message-ID: <CnvACt.LsB@world.std.com>
Source record: 27832

Hello All,

Does anyone know when the satellite forum(s) will be at Dayton?

73 Eric eac@world.std.com

479. STS-59 SAREX Flight Information

Newsgroup: rec.radio.amateur.space
Date: 1994-04-07 18:46:29 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.002.1994@ampr.org>
Source record: 27833
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.002
STS-59 SAREX Flt Info

Launch of next SAREX mission imminent

The next Shuttle Amateur Radio Experiment (SAREX) mission is ready for launch at the Kennedy Space Center in Florida. This flight, designated STS-59, is scheduled for launch on Friday April 8 at 12:06 UTC. Weather conditions could cause the launch to move forward or back by one hour. STS-59 will carry Jay Apt, N5QWL and Linda Godwin, N5RAX on a nine day mission which will include packet radio and some voice operations. A SAREX fact sheet, courtesy of Jay Apt, the ARRL and AMSAT follows. Note that during this mission, the JSC ARC, W5RRR, expects to retransmit NASA Select audio on AO-13. The planned downlink frequency will be 145.84 MHz. In addition the JSC ARC crew in Houston have set up a dial-in BBS which is now in operation. Orbital elements will be available on this machine throughout the mission. The phone number for the BBS is (713) 244-5625. Please use 9600 baud or less.

SAREX FACT SHEET - STS-59

WHO: Space Shuttle Endeavour crew

WHAT: Talk via Amateur Radio with students and radio amateurs on Earth.

WHERE: Earth Orbit. Altitude 220 kilometers, with radio coverage in latitudes from 70 degrees North to 70 degrees South. This flight is in one of the lowest altitude orbits ever flown by the shuttle, so pass times will be shorter than usual.

OPERATORS: Dr. Jay Apt (N5QWL) and Dr. Linda Godwin N5RAX.

N5QWL is the commander of the Blue Shift aboard Endeavour and will operate the shuttle systems during the "night" shift, while N5RAX is the Payload Commander, responsible for overall operation of three large radars in the shuttle's cargo bay during the "day" shift.

WHEN: April 8, 1994 at 12:06 UTC (9 day mission)

WHY: As part of the Shuttle Amateur Radio EXperiment (SAREX) component of the STS-59 mission.

SPONSORS: The American Radio Relay League (ARRL), The Radio Amateur Satellite Corporation (AMSAT) and The National Aeronautics and Space Administration (NASA).

SAREX MODES: FM Voice and Packet
VOICE CALL SIGNS: N5QWL and N5RAX
PACKET CALL SIGN: W5RRR-1

SAREX RADIO FREQUENCIES:
Voice Downlink: (Worldwide) 145.55 MHz
Voice Uplink: 144.91, 144.93, 144.95, 144.97, 144.99 MHz
Voice Uplink: (Europe only) 144.70, 144.75, 144.80 MHz
Packet Downlink: 145.55 MHz
Packet Uplink: 144.49 MHz

Successful QSOs on voice will be facilitated by using
standard international phonetics for your call sign.
The crew not answer any stations using non-standard
phonetics. Use your entire call sign -- the crew logs with an
audio tape recorder. Do not use the Shuttle call sign --
passes are very short, and the crew wants to work as many
folks as possible.

If you can, decrease your radio's deviation to 3 KHz (most are
initially set at 5 KHz) and compensate for the Doppler shift. If
you cannot, wait until a minute or 90 seconds after the Shuttle comes over
your horizon to transmit -- that will put you within the SAREX IF. The above
applies to both voice and packet.

INFORMATION: Goddard Amateur Radio Club, Greenbelt, MD, WA3NAN. SAREX
news and NASA Mission audio retransmissions on 3.86, 7.185,
14.295, 21.395, and 28.65 MHz and on VHF at 147.45 MHz.

Johnson Space Center Amateur Radio Club, Houston,TX, W5RRR.
SAREX news bulletins on HF bands at 3.850, 7.227, 14.280,
21.350, and 28.400 MHz and VHF at 146.64 MHz.
Also 145.84 on AO-13 at times

ARRL, Newington, CT, W1AW.
SAREX news bulletins (9:45 PM, 12:45 AM EST) on
HF bands at 3.99, 7.29, 14.29, 18.16, 21.39, 28.59
and VHF at 147.555 MHz.

PARTICIPATING
SCHOOLS: Ealy Elementary School, West Bloomfield, MI
Kanawha Elementary School Davisville, WV
Alcatel Amateur Radio Association and Circle 10 Council-BSA
Richardson, TX
Anthony Elementary, Anthony, KS
St. Bernard High School, Playa Del Rey, CA
Country Club School, San Ramon, CA 94583
Deep Creek Middle School, Baltimore, MD 21221
Paltamo Senior High School, Paltamo Finland
Ogilvie School, Northampton, Western Australia

OPERATIONS NOTES:
If you have a packet QSO number issued to you by the
robot, don't try to get another one! The on-board

program drops the duplicates anyhow, and all you
are doing is making it harder for the other folks.
A QSL card will be issued if you appear in the "heard"
list on the TNC.

N5QWL will be asleep over most USA passes, and N5RAX will
be busy with assigned duties for most daylit US passes, so
if the sun is up, try SAREX on packet. The Shuttle crew
will try to work voice (1) when we are not otherwise engaged,
and (2) at night or when the ground is cloudy (we are
generally busy taking pictures of the Earth during clear
daylight passes).

If Jay Apt can get to it, he will activate the SAREX about
3 hours into the mission.

QSL via: ARRL, ATTN: STS-59 QSLs, 225 Main Street, Newington, CT 06111,
USA. Include a self-addressed stamped envelope (SASE). Non-US
stations include a self addressed envelope with $0.50 of US
postage affixed or appropriate IRCs. Include the Callsign worked,
Date, UTC, Mode, and Frequency. For packet contacts, include the
QSO number issued by the robot. SWL QSL's: Include the Callsign
heard, Date, UTC, Mode, and Frequency.

STS-59 Keplerian elements for a 12:06 UTC launch:

STS-59
1 00059U 94098.74878017 .00221188 00000-0 11303-3 0 80
2 00059 57.0053 277.0416 0009259 269.9963 90.0094 16.19806752 54

Satellite: STS-59
Catalog number: 00059
Epoch time: 94098.74878017 = (08 APR 94 17:58:14.61 UTC)
Element set: 008
Inclination: 57.0053 deg
RA of node: 277.0416 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-008
Arg of perigee: 269.9963 deg Launch: 08 APR 94 12:06 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5
Checksum: 325

Submitted by Frank Bauer, KA3HDO for the SAREX Working Group

/EX

480. Satellite Tracking Program

Newsgroup: rec.radio.amateur.space
Date: 1994-04-07 23:24:24 UTC
From: dfk@col.hp.com
Message-ID: <2o24n8$3d3@hp-col.col.hp.com>
Source record: 27834

I have posted a simple satellite tracking program that runs on
the HP48S/SX and HP48G/GX calculators. It is in the group:

comp.sys.hp48

Check it out if interested.

Dave Kurth N0UVR
dfk@col.hp.com

481. Greenland to Maryland?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 02:52:07 UTC
From: mitchell@aol14.wff.nasa.gov
Message-ID: <2o2gsn$1r9@paperboy.gsfc.nasa.gov>
Source record: 27835

...i never thought to look here, but when i read David Kurth's post in the hp48 group...

Based on the great experiences of everyone here, what are the chances that someone in Thule, Greenland would have to talk to someone in Maryland via 2m/70cm satellite? Is there one that would be in range at both places at the same time (for more than, say, 2 seconds)? Is Thule to far north for anything? What about packet?

I'm just looking for general thoughts...

Thanks,

Richard "being sent to the cold north for spring" Mitchell
---------------------------+-----------------------------------
Richard Mitchell | Learning to Do Doing to Learn
mitchell@aol14.wff.nasa.gov | Earning to Live Living to Serve
N3LNK |

482. ORBS$098.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 05:09:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-098.o.1994@ampr.org>
Source record: 27836
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-098.O
Orbital Elements 098.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX April 8, 1994
BID: $ORBS-098.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94093.93015575
Element set: 273
Inclination: 27.1781 deg
RA of node: 334.0078 deg
Eccentricity: 0.6020533
Arg of perigee: 167.5108 deg
Mean anomaly: 219.1680 deg
Mean motion: 2.05877978 rev/day
Decay rate: -1.05e-06 rev/day^2
Epoch rev: 8125
Checksum: 301

Satellite: UO-11
Catalog number: 14781
Epoch time: 94096.58268703
Element set: 679
Inclination: 97.7904 deg
RA of node: 114.6531 deg
Eccentricity: 0.0012422
Arg of perigee: 134.3680 deg
Mean anomaly: 225.8545 deg
Mean motion: 14.69185628 rev/day
Decay rate: 3.27e-06 rev/day^2
Epoch rev: 53979
Checksum: 341

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94096.18122248
Element set: 887
Inclination: 82.9274 deg
RA of node: 22.0643 deg
Eccentricity: 0.0010248
Arg of perigee: 220.6223 deg
```

Mean anomaly: 139.4177 deg
Mean motion: 13.72334834 rev/day
Decay rate: 6.7e-07 rev/day^2
Epoch rev: 34003
Checksum: 288

Satellite: AO-13
Catalog number: 19216
Epoch time: 94091.48205291
Element set: 898
Inclination: 57.8647 deg
RA of node: 260.1651 deg
Eccentricity: 0.7210810
Arg of perigee: 338.2200 deg
Mean anomaly: 2.3008 deg
Mean motion: 2.09726624 rev/day
Decay rate: -4.61e-06 rev/day^2
Epoch rev: 4440
Checksum: 282

Satellite: FO-20
Catalog number: 20480
Epoch time: 94093.91224327
Element set: 673
Inclination: 99.0286 deg
RA of node: 259.8058 deg
Eccentricity: 0.0541198
Arg of perigee: 147.6860 deg
Mean anomaly: 215.8633 deg
Mean motion: 12.83224718 rev/day
Decay rate: -4.3e-07 rev/day^2
Epoch rev: 19460
Checksum: 323

Satellite: AO-21
Catalog number: 21087
Epoch time: 94096.76922921
Element set: 451
Inclination: 82.9460 deg
RA of node: 195.5516 deg
Eccentricity: 0.0033925
Arg of perigee: 284.0542 deg
Mean anomaly: 75.6843 deg
Mean motion: 13.74537051 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 15977
Checksum: 326

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94095.92841184

Element set: 677
Inclination: 82.9188 deg
RA of node: 65.0333 deg
Eccentricity: 0.0028619
Arg of perigee: 312.8771 deg
Mean anomaly: 46.9979 deg
Mean motion: 13.74038159 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 15872
Checksum: 348

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94089.09349977
Element set: 248
Inclination: 1.5156 deg
RA of node: 104.5135 deg
Eccentricity: 0.2923641
Arg of perigee: 175.5080 deg
Mean anomaly: 188.1427 deg
Mean motion: 1.42202601 rev/day
Decay rate: -1.05e-06 rev/day^2
Epoch rev: 7
Checksum: 273

/EX

483. ORBS$098.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 05:12:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-098.d.1994@ampr.org>
Source record: 27837
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-098.D
Orbital Elements 098.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX April 8, 1994
BID: $ORBS-098.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94094.18864115
Element set: 978
Inclination: 98.5904 deg
RA of node: 179.9647 deg
Eccentricity: 0.0011994
Arg of perigee: 50.9587 deg
Mean anomaly: 309.2663 deg
Mean motion: 14.29834719 rev/day
Decay rate: 6.3e-07 rev/day^2
Epoch rev: 21901
Checksum: 351

Satellite: AO-16
Catalog number: 20439
Epoch time: 94093.26738149
Element set: 778
Inclination: 98.6001 deg
RA of node: 180.2108 deg
Eccentricity: 0.0012270
Arg of perigee: 53.9212 deg
Mean anomaly: 306.3104 deg
Mean motion: 14.29889216 rev/day
Decay rate: 7.6e-07 rev/day^2
Epoch rev: 21889
Checksum: 309

Satellite: DO-17
Catalog number: 20440
Epoch time: 94093.71879587
Element set: 777
Inclination: 98.5997 deg
RA of node: 180.9543 deg
Eccentricity: 0.0012412
Arg of perigee: 51.3730 deg
```

Mean anomaly: 308.8563 deg
Mean motion: 14.30028150 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 21897
Checksum: 330

Satellite: WO-18
Catalog number: 20441
Epoch time: 94094.25256090
Element set: 779
Inclination: 98.6007 deg
RA of node: 181.4888 deg
Eccentricity: 0.0013013
Arg of perigee: 50.7174 deg
Mean anomaly: 309.5160 deg
Mean motion: 14.30003284 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 21905
Checksum: 288

Satellite: LO-19
Catalog number: 20442
Epoch time: 94093.74592051
Element set: 777
Inclination: 98.6010 deg
RA of node: 181.2260 deg
Eccentricity: 0.0013246
Arg of perigee: 51.9430 deg
Mean anomaly: 308.2937 deg
Mean motion: 14.30098281 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 21899
Checksum: 297

Satellite: UO-22
Catalog number: 21575
Epoch time: 94096.62196308
Element set: 480
Inclination: 98.4392 deg
RA of node: 172.5493 deg
Eccentricity: 0.0008170
Arg of perigee: 138.1574 deg
Mean anomaly: 222.0255 deg
Mean motion: 14.36905377 rev/day
Decay rate: 1.04e-06 rev/day^2
Epoch rev: 14280
Checksum: 303

Satellite: KO-23
Catalog number: 22077
Epoch time: 94093.90979456

Element set: 374
Inclination: 66.0795 deg
RA of node: 75.4986 deg
Eccentricity: 0.0012237
Arg of perigee: 305.4986 deg
Mean anomaly: 54.4889 deg
Mean motion: 12.86285631 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7723
Checksum: 354

Satellite: AO-27
Catalog number: 22825
Epoch time: 94095.20620110
Element set: 275
Inclination: 98.6598 deg
RA of node: 171.7361 deg
Eccentricity: 0.0009638
Arg of perigee: 62.0236 deg
Mean anomaly: 298.1903 deg
Mean motion: 14.27616610 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 2727
Checksum: 304

Satellite: IO-26
Catalog number: 22826
Epoch time: 94094.70192756
Element set: 275
Inclination: 98.6593 deg
RA of node: 171.2616 deg
Eccentricity: 0.0010140
Arg of perigee: 64.2606 deg
Mean anomaly: 295.9612 deg
Mean motion: 14.27719595 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 2720
Checksum: 312

Satellite: KO-25
Catalog number: 22830
Epoch time: 94093.74818451
Element set: 278
Inclination: 98.5599 deg
RA of node: 168.3571 deg
Eccentricity: 0.0012553
Arg of perigee: 37.4701 deg
Mean anomaly: 322.7354 deg
Mean motion: 14.28044298 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 2707

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Checksum: 325

/EX
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484. ORBS$098.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 05:17:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-098.m.1994@ampr.org>
Source record: 27838
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-098.M
Orbital Elements 098.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX April 8, 1994
BID: $ORBS-098.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94093.75201779
Element set: 268
Inclination: 98.6553 deg
RA of node: 170.3360 deg
Eccentricity: 0.0011162
Arg of perigee: 53.7559 deg
Mean anomaly: 306.4652 deg
Mean motion: 14.28016008 rev/day
Decay rate: 7.6e-07 rev/day^2
Epoch rev: 2707
Checksum: 298

Satellite: MIR
Catalog number: 16609
Epoch time: 94096.79131291
Element set: 558
Inclination: 51.6471 deg
RA of node: 184.1054 deg
Eccentricity: 0.0015736
Arg of perigee: 115.6169 deg
Mean anomaly: 244.6451 deg
Mean motion: 15.58521118 rev/day
Decay rate: 6.403e-05 rev/day^2
Epoch rev: 46490
Checksum: 306

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94095.90580279
Element set: 464
Inclination: 28.4718 deg
RA of node: 340.2613 deg
Eccentricity: 0.0005998
Arg of perigee: 52.7779 deg
```

Mean anomaly: 307.3363 deg
Mean motion: 14.90560134 rev/day
Decay rate: 9.57e-06 rev/day^2
Epoch rev: 1859
Checksum: 324

Satellite: GRO
Catalog number: 21225
Epoch time: 94096.05631878
Element set: 80
Inclination: 28.4631 deg
RA of node: 12.7463 deg
Eccentricity: 0.0003574
Arg of perigee: 122.8378 deg
Mean anomaly: 237.2614 deg
Mean motion: 15.40560142 rev/day
Decay rate: 5.016e-05 rev/day^2
Epoch rev: 4580
Checksum: 273

Satellite: UARS
Catalog number: 21701
Epoch time: 94095.89941204
Element set: 500
Inclination: 56.9821 deg
RA of node: 88.7357 deg
Eccentricity: 0.0004369
Arg of perigee: 96.0653 deg
Mean anomaly: 264.0883 deg
Mean motion: 14.96441515 rev/day
Decay rate: -1.918e-05 rev/day^2
Epoch rev: 14011
Checksum: 306

/EX

485. ORBS$098.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 05:20:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-098.n.1994@ampr.org>
Source record: 27839
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-098.N
2Line Orbital Elements 098.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX April 8, 1994
BID: $ORBS-098.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94093.93015575 -.00000105 00000-0 10000-3 0 2737
2 14129 27.1781 334.0078 6020533 167.5108 219.1680 2.05877978 81253
UO-11
1 14781U 84021B 94096.58268703 .00000327 00000-0 63285-4 0 6798
2 14781 97.7904 114.6531 0012422 134.3680 225.8545 14.69185628539790
RS-10/11
1 18129U 87054A 94096.18122248 .00000067 00000-0 57349-4 0 8872
2 18129 82.9274 22.0643 0010248 220.6223 139.4177 13.72334834340034
AO-13
1 19216U 88051B 94091.48205291 -.00000461 00000-0 10000-4 0 8980
2 19216 57.8647 260.1651 7210810 338.2200 2.3008 2.09726624 44409
FO-20
1 20480U 90013C 94093.91224327 -.00000043 00000-0 -30944-4 0 6734
2 20480 99.0286 259.8058 0541198 147.6860 215.8633 12.83224718194603
AO-21
1 21087U 91006A 94096.76922921 .00000093 00000-0 82657-4 0 4517
2 21087 82.9460 195.5516 0033925 284.0542 75.6843 13.74537051159776
RS-12/13
1 21089U 91007A 94095.92841184 .00000034 00000-0 20820-4 0 6777
2 21089 82.9188 65.0333 0028619 312.8771 46.9979 13.74038159158721
ARSENE
1 22654U 93031B 94089.09349977 -.00000105 00000-0 00000 0 0 2486
2 22654 1.5156 104.5135 2923641 175.5080 188.1427 1.42202601 77
UO-14
1 20437U 90005B 94094.18864115 .00000063 00000-0 41497-4 0 9785
2 20437 98.5904 179.9647 0011994 50.9587 309.2663 14.29834719219014
AO-16
1 20439U 90005D 94093.26738149 .00000076 00000-0 46422-4 0 7787
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2 20439 98.6001 180.2108 0012270 53.9212 306.3104 14.29889216218893
DO-17
1 20440U 90005E 94093.71879587 .00000058 00000-0 39572-4 0 7778
2 20440 98.5997 180.9543 0012412 51.3730 308.8563 14.30028150218972
WO-18
1 20441U 90005F 94094.25256090 .00000049 00000-0 35972-4 0 7799
2 20441 98.6007 181.4888 0013013 50.7174 309.5160 14.30003284219059
LO-19
1 20442U 90005G 94093.74592051 .00000060 00000-0 40227-4 0 7773
2 20442 98.6010 181.2260 0013246 51.9430 308.2937 14.30098281218993
UO-22
1 21575U 91050B 94096.62196308 .00000104 00000-0 49862-4 0 4801
2 21575 98.4392 172.5493 0008170 138.1574 222.0255 14.36905377142801
KO-23
1 22077U 92052B 94093.90979456 -.00000037 00000-0 10000-3 0 3742
2 22077 66.0795 75.4986 0012237 305.4986 54.4889 12.86285631 77231
AO-27
1 22825U 93061C 94095.20620110 .00000048 00000-0 37491-4 0 2754
2 22825 98.6598 171.7361 0009638 62.0236 298.1903 14.27616610 27271
IO-26
1 22826U 93061D 94094.70192756 .00000052 00000-0 38697-4 0 2753
2 22826 98.6593 171.2616 0010140 64.2606 295.9612 14.27719595 27201
KO-25
1 22830U 93061H 94093.74818451 .00000059 00000-0 41116-4 0 2788
2 22830 98.5599 168.3571 0012553 37.4701 322.7354 14.28044298 27075
NOAA-9
1 15427U 84123A 94096.96691714 .00000104 00000-0 79416-4 0 7745
2 15427 99.0631 146.5985 0016149 62.1791 298.1005 14.13604747480288
NOAA-10
1 16969U 86073A 94096.95319952 .00000054 00000-0 41269-4 0 6730
2 16969 98.5122 108.1277 0012929 173.0330 187.1032 14.24877528392460
MET-2/17
1 18820U 88005A 94093.66879616 .00000072 00000-0 50427-4 0 2763
2 18820 82.5429 327.8717 0018087 33.1391 327.0888 13.84712948312043
MET-3/2
1 19336U 88064A 94089.83574800 .00000051 00000-0 10000-3 0 2727
2 19336 82.5443 19.1260 0018339 97.2779 263.0433 13.16965918272948
NOAA-11
1 19531U 88089A 94083.23885812 .00000062 00000-0 58133-4 0 5722
2 19531 99.1670 70.0925 0012545 15.7107 344.4450 14.12969487283226
MET-2/18
1 19851U 89018A 94093.77791533 .00000070 00000-0 49481-4 0 2751
2 19851 82.5203 203.2318 0015846 76.3600 283.9325 13.84360581257398
MET-3/3
1 20305U 89086A 94096.89802122 .00000044 00000-0 10000-3 0 196
2 20305 82.5496 319.2682 0006914 92.4930 267.6966 13.04406356213600
MET-2/19
1 20670U 90057A 94092.98290424 .00000024 00000-0 79036-5 0 7778
2 20670 82.5407 268.1974 0016849 2.5004 357.6234 13.84189785190216
FY-1/2
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1 20788U 90081A 94096.57359175 -.00000029 00000-0 93257-5 0 9356
2 20788 98.8347 118.9912 0013640 203.7746 156.2787 14.01311548183679
MET-2/20
1 20826U 90086A 94094.25698003 .00000080 00000-0 59029-4 0 7861
2 20826 82.5246 204.7890 0011958 255.0900 104.8936 13.83576540177538
MET-3/4
1 21232U 91030A 94093.84087512 .00000050 00000-0 10000-3 0 6843
2 21232 82.5414 222.1406 0013588 17.3282 342.8306 13.16460528141571
NOAA-12
1 21263U 91032A 94093.55971056 .00000146 00000-0 84888-4 0 9892
2 21263 98.6259 122.9593 0014150 91.5218 268.7581 14.22387096149927
MET-3/5
1 21655U 91056A 94097.16784425 .00000051 00000-0 10000-3 0 6926
2 21655 82.5566 166.8994 0014492 19.2230 340.9434 13.16829137127113
MET-2/21
1 22782U 93055A 94093.48854630 .00000015 00000-0 95213-7 0 2868
2 22782 82.5455 265.6275 0023942 74.0584 286.3202 13.83003079 29764
POSAT
1 22829U 93061G 94093.75201779 .00000076 00000-0 48417-4 0 2685
2 22829 98.6553 170.3360 0011162 53.7559 306.4652 14.28016008 27078
MIR
1 16609U 86017A 94096.79131291 .00006403 00000-0 88312-4 0 5585
2 16609 51.6471 184.1054 0015736 115.6169 244.6451 15.58521118464908
HUBBLE
1 20580U 90037B 94095.90580279 .00000957 00000-0 80537-4 0 4646
2 20580 28.4718 340.2613 0005998 52.7779 307.3363 14.90560134 18595
GRO
1 21225U 91027B 94096.05631878 .00005016 00000-0 11341-3 0 803
2 21225 28.4631 12.7463 0003574 122.8378 237.2614 15.40560142 45801
UARS
1 21701U 91063B 94095.89941204 -.00001918 00000-0 -14672-3 0 5006
2 21701 56.9821 88.7357 0004369 96.0653 264.0883 14.96441515140111
/EX
```

486. Re: Greenland to Maryland?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 12:16:19 UTC
From: ae517@FreeNet.Carleton.CA
Message-ID: <Cnxwr7.Ln8@freenet.carleton.ca>
Source record: 27840

In a previous article, mitchell@aol14.wff.nasa.gov (Richard Mitchell 1026) says:

>Based on the great experiences of everyone here, what are the
>chances that someone in Thule, Greenland would have to talk
>to someone in Maryland via 2m/70cm satellite? Is there one
>that would be in range at both places at the same time (for
>more than, say, 2 seconds)? Is Thule to far north for anything?
>What about packet?

I assume you are speaking of mode B (or mode J, for that matter)
satellites other than AO-10 and AO-13, which should fill your requirements
quite nicely.

Well, all of the packet satellites should work just fine. I recall seeing
ve8dx up in Pond Inlet on the KO-23 queue. He's roughly the same
latitude, give or take a few degrees. I think I've even heard him on RS-10.

73 de va3rr/aa8lu
--

487. Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 15:28:09 UTC
From: JAY@medicine.dmed.iupui.edu
Message-ID: <JAY.17.2DA57809@medicine.dmed.iupui.edu>
Source record: 27841

I am new to satelite communications. (This is just a warning!)

I would like to build a 2m & a 70cm beam for use with satelites. Does anyone know of an article in QST or some other plan for such antennas?
From what I understand, a normal 2m or 70cm beam antenna would work, but a circular polorization would be much better. I have no idea how one would build a circular polorized antenna.

Thanks
Jay KA9OKT

488. STS-59 Element Set (94099.706)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 16:15:43 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94099.706@alsys.com>
Source record: 27842
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 00059U 94099.70641906 .00221188 00000-0 11303-3 0 93
2 00059 57.0053 262.7355 0009259 269.9963 90.0094 16.19806752 57

Satellite: STS-59
Catalog number: 00059
Epoch time: 94099.70641906 = (09 APR 94 16:57:14.61 UTC)
Element set: 009
Inclination: 57.0053 deg
RA of node: 262.7355 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-009
Arg of perigee: 269.9963 deg Launch: 09 APR 94 11:05 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
```

489. MONTHLY POSTING:Ham Satellite FAQ

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 17:33:21 UTC
From: stephen@hpdmlge.boi.hp.com
Message-ID: <CnyBFL.D2K@boi.hp.com>
Source record: 27843
Cross-posted to: rec.radio.amateur.space,rec.radio.info

REVISION: 8 APR 1994

CONTENTS:

Forward - my ramblings
Bibliography - list of sources and how to get more information
Modes - common satellite operating modes
Satellites - descriptions and background history of common satellite
Antennas - discussion of what works best
Preamps - discussion of what is needed
Rigs - popular satellite rigs and features
Accessories and Other Stuff - things that make satellte operation easier
Frequencies - list of most hamsats with uplink/downlink freq/modes

FORWARD:

Having recently started to get into Satellites, I asked MANY people what it took to get started and what to do. I found few people who could offer all the information necessary to start. I have attempted to compile this information for future newbies. If I have missed something, please ask and I will attempt to add it to the collection. Any comments can be sent directly to me, stephen@mail.boi.hp.com. Copies of this article should be available in the following locations:

oak.oakland.edu:/pub/hamradio/docs/faq
ftp.cs.buffalo.edu:/pub/ham-radio
Clear Skies BBS (608)249-7130

Also, if you really want to get serious about satellites, I would STRONGLY recommend joining AMSAT to help promote the satellite hobby. AMSAT is a volunteer organization that works for the interests of amateur satellites. Dues are only US$30 per year and you will receive a subscription to "The AMSAT Journal". For US$80, you will receive first year dues and a copy of Instant Track computer tracking software which is a top-notch program. Instant Track was donated to AMSAT by its author and its sales account for a considerable portion of AMSAT's income. AMSAT-NA, 850 Sligo Avenue, Silver Spring, MD 20910-4703. (301) 589-6062. Credit cards welcome.
NOTE: I am in no way connected with AMSAT-NA, other than I have found their publications quite useful.

BIBLIOGRAPHY:

The following text was compiled from the following sources and from comments from many operators:

* "How to use the EZSATS pass tables by N9LTD" reprinted with permission. Full text, tables, and lots of other useful information can be obtained by sending a SASE to David Mullenix N9LTD, 2052 Brentwood Pky, Madison, WI 53704 or call the Clear Skies BBS at (608)249-7130.

* "Amateur Radio Satellite Frequencies" This file can be obtained from the ARRL e-mail server. For information on the server, send an e-mail message to info-serv@arrl.org with 'HELP' in body of message.

* "Summary - Getting onto the Hamsats" This was an article posted to rec.radio.amateur.misc newsgroup by Stephan Greene (sgreene@access.digex.com) on 20 Mar 1992. The article is also available via anon ftp from ftp.cs.buffalo.edu or Australian mirror at grivel.une.edu.au as file pub/hamradio/ham_sat_sum.

* "An Amatuer Satellite Operation Upgrade Path" from the AMSAT Journal, September/October 1993, pp. 24-26.

MODES:

The combination of uplink freq, downlink freq, and transmission mode are all lumped together into standardized satellite MODES. Here is a list of common satellite modes used by satellites covered by this article:

A - This mode requires a 2 meter SSB/CW trasmitter and a 10 meter SSB/CW receiver and supports CW and voice.

B - This mode requires a 70 cm SSB/CW transmitter and a 2 meter SSB/CW receiver and supports CW and voice. Some satellites also support RTTY and SSTV in this mode.

K - This mode requires a 15 meter SSB/CW transmitter and a 10 meter SSB/CW receiver and supports CW and voice. This mode is unique in that it can be done with a simple HF rig.

JA- This mode stands for J Analog and requires a 2 meter SSB/CW transmitter and a 70 cm SSB/CW receiver and supports CW, voice.

JD- This mode stands for J Digital and requires a 2 meter FM transmitter and and a 70 cm SSB/CW receiver and supports packet.

S - This mode requires a 70 cm SSB/CW transmitter and a 2.4 GHz SSB/CW receiver and supports CW and voice. Many people use a 2.4 GHz to 2 meter converter with a 2 meter SSB/CW receiver instead of buying a 2.4 GHz SSB/CW receiver.

T - This mode requires a 15 meter SSB/CW transmitter and a 2 meter SSB/CW receiver and supports CW and voice.

Some satellites have dual modes that operate simultaneously. For example, AO-13 can operate in mode BS which means that it can do both mode B and mode S simulaneously. Other common dual modes are KT and KA.

Also, satellites have 3 basic types of retransmissions: beacon, transponder, and repeater.

Beacon - Most satellites have a fixed Morse beacon at the lower end of the satellites band-pass transponder. This is useful to detect when the satellite has crossed the horizon and is in range for operation. It can also be used to determine dopler shifts.

Transponder - A transponder is a band-pass repeater. It accepts a range of frequencies on the input and retransmits the entire range on the output. All offsets withing that range are preserved. NOTE: since the satellite is transmitting many signals at the same time, it is dividing its output power amongst all of these signals. If someone transmits a very powerful signal into the satellite, it will spend most of its power retransmitting that signal and all of the other signals will drop in power. This is NOT a way to earn friends and people who overpower the satellites input are called "alligators" and are not very popular.

Repeater - This closely resembles a land-based repeater. It listens for signals on one frequency and retransmits it on another frequency. All satellite repeaters (and transponders) are full duplex, meaning you can (and should) listen to you signal on the downlink (with headphones) while you are transmitting.

SATELLITES:

Some satellites are easier to work than others. The satellites that follow can be operated fairly easily and are referred to by some as the Easy Sats. What follows is a breif description of each satellite. A summary list of operating frequencies is included later.

Mir

Mir (promounced "mere" - "Peace" in Russian) is the Russian Space Station. It's been in orbit since 1986. All recent Russian Cosmonauts have been hams and have callsigns with "MIR" in them, such as U2MIR. Mir has 2-meter equipment on board and they operate packet and voice on 145.55 MHz. (This is the same freq as the Space Shuttles.) The cosmonauts also have a digital voice recorder which can repeatedly transmit voice announcements.

The best way to get a QSL card from Mir is to connect to their TNC's mailbox, R0MIR-1, (That's R Zero MIR) leave a message AND GET A MESSAGE NUMBER. You must have the message number to qualify for a QSL. The TNC is often busy because amatuers forget to disconnect before Mir goes under their horizon. In a case like this, try connecting to yourself or a friend VIA R0MIR. And if you hear a heavily accented voice calling CQ, by all means say hello!

70 cm and ATV gear is being prepared for future flights!

QSL Address:
Sergei Samburov (RV3DR)
Prospect Kosmonavtov. d.36, kw.96
Kaliningrad City, MOSCOW 141070, RUSSIA.

Sergei can also be reached via packet radio as RV3DR @ RK3KP.#MSK.RUS.EU

A special note on caculating Mir's orbit: Mir is big and it's in a low orbit. This means that there's a lot of atmospheric drag and it has to fire

its rockets every month or two to boost itself back up or it would have re-entered and burned up long ago. Unfortunately, whenever this happens, it throws off all pass predictions. When this happens, Mir will arrive LATER than predicted, so if you tune to 145.55 and nothing happens at the predicted time, keep waiting, it may be along in 10-30 minutes.

SEEING MIR: Mir is also the only EZSAT that can bee seen. Mir is very big, about the size of a semi-trailer, and when it comes over just after sunset or just before sunrise, you can often see it go by. This is because Mir will still be in sunlight whil you're in the earth's shadow. In these cases, Mir looks like a very bright star gliding acress the sky. It's a beautiful sight and well worth looking for. It's best to use a tracking program set to VISUAL to find visible passes. The best such programs will even draw you a star map and show you Mir's path across it. Don't forget to tune to 145.55 when you see it. Also, don't forget to get on the local repeater and tell people when you spot it so that others can share in the fun.

RS-10/11, RS-12/13, OSCAR-21(RS-14)

These three satellites are all in 600 mile high polar orbits, which carry them over the US six to eight times a day for 10-18 minutes at a time. They all have orbital periods of about 95 minutes and we typically get two sets of three or four passes spaced 95 minutes apart. The two sets of passes are spaced 12 hours apart and their passes come a little earlier each day because their orbits don't take quite exacly 95 minutes.

These satellites all have a coverage circle about 4000 miles in diameter, so when they're about the horizon, you can use them to work hams anywhere in the conteinental US, Canada, Alaska, Mexico, Central America, South America down to the Equator, the Caribbean, Greenland, Iceland and parts of Scandinavia. Eastern hams can work Europe and the West can work Hawaii.

All of these satellites are in boxes that are bolted to larger Russian satellites and draw their power from the large satellite's solar cells. They are VERY easy to hear and fairly simple to work.

OSCAR-21

My favorite satellite. This is a German/Russian radio that uses a Digital Signal Processor (DSP) chip and it is Flexible with a capital "F"! It was launched in January, 1990 configured as a linear translator which received a band of 70 cm CW and SSB signals and relayed them on 2 meters. The bird was, to put it mildly, under-utilized. Then in 1992 the DSP chip was reprogrammed in orbit into a cross band FM repeater! If you've been wondering if DSP is as powerful as you've heard, now you know! In the past year, it's telemetry has been re-programmed from an obscure format to standard 1200 baud packet. WEFAX pictures (which are uploaded by teh ground controllers) were added in December 1993. (This is the same format used by many weather sats and short wave weather stations.)

OSCAR-21 has an input frequency of 435.016 MHz, but 435.015 works just fine. It's output frequency is 145.987 MHz, but 145.985 or 145.990 will recieve it quite well. It has a strong transmitter and a ground plane antenna and most

HTs have no trouble picking its signals up when it passes over. Mobiles and base stations with omni antennas will receive it full quieting. You can get into this bird with 20 watts and a six element beam antenna. I mount my beam on a photo tripod next to my car and run coax to my dual band mobile. You have to point the beam accurately, so I take a list of altitude and azimuth bearing generated by simple tracking software out with me and re-point the beam once a minute. In one summer, I worked the east and west coasts, several Canadians, Texas and Guantanamo Bay, Cuba before fall's cold weather drove me indoors.

Some OSCAR-21 tips: you can hardly get a word in edgewise during "prime time" opening passes. Try the late night passes instead, they're much less crowded. OSCAR-21's transmit and recieve polarity rotate constantly during a pass. Mount your beam so you can easily rotate it for the best signal. Remember, all these ham sats are full duplex, so you can and should monitor your signal on the downlink. (Use headphones.) Turn the beam for minimum noise. You'll probably have to modify your dual band rig to get it to transmit on 435.015. BE CAREFUL beacuse FM is generally NOT appreciated below 440 MHz. Also, the mod may allow you to transmit out of band, which is a real no-no.

OSCAR-21 is also known as RS-14, AO-21 and Rudak-2. It's bolted to a satellite called INFORMATOR-1, which is often abbreviated INFORMTR-1. It's NORAD ID number is 21087. Be careful, the rocket booster that launched the satellite is still up there and it's named INFORMTR-1 R/B in some element sets. Your tracking program may find it instead of the satellite if you're not careful.

RS-10/11

This is probably the easiest satellite to work of them all. It has an incredibly sensitive receiver that can pick up the faintest two meter signal and relay it on ten meters. There are documented examples of people having QSOs on RS-10/11 by clicking Morse on HTs with rubber duck antennas! I guarantee you that your HT can put a useable signal into RS-10/11, I've done it myself. WARNING: if you try this, disable the microphone so you don't transmit any FM sidebands and turn your CTCSS (PL) OFF!

RS-10/11 (Radio Sputnik) is for CW and SSB signals, so an all mode 2 meter rig is ideal for transmitting to this bird. The input bandpass is from 145.860 - 145.900 and the output freqs are from 29.360 - 29.400 MHz. There is also a morse beacon at 29.357 MHz.

RS-10 is also equiped with a feature called ROBOT. The ROBOT is an automatic on-board QSO computer. To work it, send the following at about 15-20 wpm on 145.82 MHz (an automated keyer works best):

RS-10 DE (your call) AR

If the ROBOT hears you, it will respond on the 29.403 MHz downlink with:

(your call) DE RS-10 QSL NR (number) OP ROBOT TU USW QSO (number) 73 SK

If you want a QSL card, try sending the QSL number the ROBOT sent back to you on your QSL (along with an SASE and return postage) to:

Andrey Mironov
UL Vvoloshinoj. D11. KV72.
141000 Station Perlovskaya
Moscow, Russia

RS-12/13

A cousin to RS-10/11, RS-12/13 is also a 40 KHz wide linear transponder. However, this bird is unique because its input frequencies are in the fifteen meter band! This is also the only ham sat in the sky that requires more than a code free technician license to work it, because its input band is from 21.210 - 21.250 MHz. This straddles the Advanced and Extra portions of the 15 meter band. Its output freqs are from 29.410 - 29.450 MHz. Because of skip, this satellite can often be heard and worked when it's below the horizon! At least one person has earned DXCC on this satellite! RS-12/13 is bolted to yet another Russian satellite and its NORAD ID is 21089. RS-12/13 also has a ROBOT mode like its brother RS-10/11.

DOVE

DOVE is short for Digital Orbiting Voice Encoder and is a transmit-only hamsat (it has no user accessible receiver). Built in Argentina, DOVE was launched in 1990 as a good will satellite to introduce children and newcomers to amateur satellites. It was originally intened to transmit digitized voice messages that could be picked up by students with simple receivers. Unfortunately, the digital voice hardware and software has been a constant source of problems since launch. Atempts to get DOVE to works properly are proceeding as this is written, so the best bet is to tune your 2-meter rig or scanner to 145.825 MHz and see what the bird is up to currently. Be ready for Morse, standard 1200 baud packet or (with luck) digitized voice messages. The signals are strong enough so that an HT with a rubber duck will hear it when it's overhead, although ground plane antennas will give better coverage when the bird is near the horizon.

AO-10

Known as Phase 3-B before it's launch by the European Space Agency in June, 1983, this satellite was designed for launch into a high elliptical orbit. This orbit, called "Molniya" orbit, places the satellite over one spot on the Earth for up to several hours at a time. This orbital configuration also allows for consistent, long haul DX communication because the satellite is visable to roughly half the Earth! This orbit virtually eliminates the frantic "hurry up" style of operation. But such a luxury is not without cost. At the farthest point in the Molniya orbit, this satellite is over 25,000 miles away from the Earth, meaning high gain antennas and higher power levels are required to get a workable signal up and through the bird. Also, even though radio waves travel at the speed of light, the over 50,000 mile round trip creates a signal path delay of about 1/4 second on the downlinked signal. It takes some time for satellite operators to get used to simultaneously speaking and listening to their own voices returning in

their headphones a quarter second later.

The first Phase 3-A launch ended in disaster when the Ariane booster malfunctioned, dropping the bird in the Atlantic. Phase 3-B, later to become OSCAR 10, met with somewhat better fortune, surviving the launch and first burn of its "kick motor" just fine. However, we later learned that the booster had apparently bumped OSCAR 10 shortly after separation which damaged one or more of its antennas and also caused other internal injuries because the second and subsequent kick motor firings never happended. This left OSCAR 10 in a lower inclination elliptical orbit. This meant that the bird didn't have the intended operational coverage nor enough solar panel illumination to sustain full operations. So today, OSCAR 10 is "sort of" operational. It is stuck in mode "B" with only its omnidirectional antennas working and it is slowly tumbling. Users are requested to listen for AO-10's 145.810 MHz beacon for a steady, unmodulated carrier before operating the bird. If the beacon is raspy or if your downlink signal appears to be shifting in frequency, users are asked NOT to use the transponder until it has a chance to slowly recharge its batteries.

AO-13

Launched in June, 1988, OSCAR-13 is now carrying the bulk of the long haul DX available via amateur satellite. It is the current--and much improved--brother to OSCAR 10. However, unlike OSCAR 10, it did managed to achiieve its "Molniya" orbit. OSCAR 13 also has the ability to automatically select transponders for each mode at different points in its orbit. This helps optimize the mode in use with its corresponding downlink antenna gain. OSCAR 13 did have some problems, however. It had a RUDAK experiment onboard that failed shortly after launch. Also, in June 1993, the 70 cm downlink transmitter ceased to function, putting an end to Mode J and L operation. However, modes B and S are still being supported and mode S is becoming increasingly popular. Also, AO-13's batteries are beginning to show signs of age and its orbit it deteriorating. The progressive effects of previously unknown gravitational interactions between AO-13, the Sun, the Moon and the Earth will all conspire to cause the satellite's re-entry into the atmosphere sometime in 1996.

ANTENNAS:

For AO-13, the consensus is get to get KLMs, Telex/Hy-Gains, or roll-your own, Nobody liked the Cushcraft satellite antennas - they appear to have problems in wet weather. Bigger is also better, if you have the space. Several people mentioned the KLM 22C and 40CX pair as excellent performers (again - you need the room for those long booms!) KE4ZV stated his pair of KLMs (the big ones!) lets him work AO-13 with 3 to 30 watts (hardline feed and rigorous attention to routing the feedlines and cables properly to maintain the antenna patterns helps, too.). Others mentioned the KLM 14C/18C pair as good performers - but you need more power on the uplink.

Telex/Hy-Gain antennas were recommended by several people as a less expensive alternative to KLMs that work almost as well. There's also M2 (started by an engineer from KLM). While no one who responded uses them,

the information I received from a call to their factory in California suggests they are comparable to slightly better than the KLMs in performance, and about the same in cost. Dave, WB6LFC, said homebrewing antennas is also feasible - it takes work, but attention to detail results in top-notch performance for very little money. Finally, Ross, VE6PDQ, reported good results using a pair of Cushcraft 215WBs on receive.

Problems encountered with AO-13 antennas include routing cables and feedlines off the back of the antennas (to preserve antenna patterns), use of fiberglass cross booms, mounting preamps as close to the feedpoint as possible, and long antenna booms drooping. (Gary, KE4ZV, recommends using a rope to brace the boom or stiffening booms and fiberglass masts internally with foam-in-a-can insulation.)

On antenna rotators, it appears the Alliance UD-100 is no longer made, though it should still show up at hamfests. People with long-boom antennas report the Alliance rotator is too weak to move a big array anyway, and recommended Yaesu's elevation-only rotator or their Model 5400 azimuth-elevation unit.

Antennas for the low-altitude satellites appear to be much less critical. J-poles were most frequently mentioned (the design from the AMSAT Journal?), but dipoles, ground-planes, and yagis are also in use. Several people work RS-10 quite well with antennas in the attic. Best results are with steerable antennas, but the high operator workload during a pass (unless the satellite is just grazing your access circle) almost demands computer control of the rotators.

PREAMPS:

You need a preamp for AO-13. (I can hear the downlink after a fashion on a Ringo fed with cheap coax and a 10 dB preamp in the shack, but it's not communications quality reception!) Only two people mentioned a specific brand name (Advanced Receiver Research and the unit included with the Ten-Tec 2510), so I assume almost any GAsFET preamp in the 20dB gain class is adequate. THE PREAMP MUST (almost always) BE MOUNTED AT THE ANTENNA (check the discussion in Chapter 9 of the Satellite Experimenter's Handbook and you'll see why!). KE4ZV recommends mounting the preamp AT the antenna feedpoint, if your elevation rotator can handle the unbalanced load.

While no one mentioned it (maybe it's obvious), if the antenna is used to transmit (say Mode J) as well as receive (on Mode B, for example), the preamp MUST either include RF-sensed switching, or be switched out of the line before you transmit. TRANSMITTING INTO AN UNPROTECTED PREAMP WILL DESTROY IT INSTANTLY!

Preamps also seem to help on RS-10 (especially with older HF rigs) and on the Pacsats. It seems to be a case of "try it, and get a preamp if it looks like it would help").

RIGS:

Three radios were mentioned by name - Yaesu FT736 (and it's predecessor, the 726 with satellite module), Kenwood TR751 (a mobile-capable 2 meter multimode), and Ten-Tec's 2510. The Ten-Tec unit is out of production. The few units left are selling for about $300-350. I'm sure other multi-mode radios, and setups with converters and transverters work well, too - it's just that no one mentioned any by name.

Power output required is a function of the satellite, your antennas, and how badly you want to communicate. [QRP on the satellites is just like QRP on HF - you need good antennas and feedline, you have to pick optimal passes, and skilled operators at both ends are needed. Given the apparent "calmer" operating style on AO-13, QRP is probably easier there than on 20 meters!]

Anyway -about power for AO-13. 3-30 watts will work if you have top-notch antennas (KE4ZV). KC7IT uses 50-100 watts (Ten Tec 2510, Mirage D1010 amplifier, KLM 14C/18C fed with 50 feet of 9913). Both KE4ZV and KC7IT use Mirage D1010 amplifiers on 70 cm when they need a little extra power. For an "optimum station", WA5ZIB recommends 60 watts on 70 cm and 80 watts on 2 meters for AO-13, assuming good antennas (Telex/Hy-Gain or better) and feedlines, and 20 watts to a 5' dish for Mode L. Andy emphasized that you can get by and have lots of fun with much less!

For Mode A, WA5ZIB said 6 watts to the AO-13 2 meter antenna will work well. People using omnis report success with the Pacsats running 50-70 watts to a J-Pole (N5VGC). Several people said they (or someone they know) have no trouble using RS-10 at lower power (10-25 watts) with simple, omnidirectional antennas. Again, it's a case of "try it and see if it works."

There was unanimous consensus that the receiving quipment (antenna, preamp, feedline, and receiver) is more important than the transmit equipment. Running more power "to hear yourself" is frowned upon, to say the least! It's also important to be able to vary uplink power to adjust to specific conditions. Both the Ten Tec 2510 and the Yaesu 736 have continuously variable power output (I guess the rest of us just have to fiddle with the drive controls on our rigs!).

ACCESSORIES AND OTHER STUFF:

You need a PSK modem to use the Pacsats. PacCom makes fully assembled units, either already integrated with their own TNC, or as a board you install in your TNC-2 clone. They make similar 9600 bps units for accessing UO-22. The downlink receiver (on 70 cm) should be capable of being tuned by the PSK modem's AFC lines. Newer radios can use the up/down lines from the microphone jack or an accessory connection on the rear panel. Older radios must be modified, or be tuned manually. N5VGC told me he sees about 20KHz of doppler on an AO-16 pass, and that without automatic tuning, operator workload is too high to do much else besides tune the receiver!

Just about any radio suitable for packet on 2 meters will work for AO-16, WO18, and LU-19. To run 9600 bps on UO-22, modifications to bypass the microphone and speaker's audio processing circuits are required. I've seen some reports on rec.radio.packet and in the various Hamsat columns that

differences between UO14 and UO-22's transmitters make UO-22 more difficult to copy. (I'll worry about that problem later - I'll start with AO-16 and LU-19 first!)

No one mentioned computers - again, it must be obvious (also, we're "talking" using computers!). They're handy, and you need one IN THE SHACK when working the Pacsats or for automated, real-time control of antenna rotators (useful for low altitude satellites).

Other operator aids mentioned, or I thought of on my own: If your radio can't slave uplink and downlink tuning (Ten Tec 2510 and Yaesu 736 can), you need something to help convert between uplink and downlink frequencies (and account for doppler shift and calibration errors on the radios' frequency readouts). A cardboard slide scale or dial will work. I'm thinking of programming my HP48 to do the conversion for me. You need something like this to know where to tune on the uplink to hear a given downlink frequency.

Software to track satellites and predict passes. There are many programs that work. Price ranges from free to $70 for state-of-the-art QuickTrack or InstantTrack (available from AMSAT). Special software is also needed to use the Pacsats, and to interpret telemetry data. This software is also available from the usual ham sources, and from AMSAT (BTW, software sales support the amateur satellite program!)

Polarity switchers optimize antenna performance by allowing switching antenna feeds from RHCP to LHCP as the need arises. They are a very useful add-on, but don't appear essential.

Equipment to measure power output, SWR, transmit frequency - all useful (see - satellites are not that different from HF!).

FREQUENCIES:

Amateur Radio Satellite Frequencies (as of January 1994)

Designation Frequencies Transponder/ Mode
Beacon
AO-10
Downlinks 145.810 B B
145.825-.975 T B
145.987 B B (Usually off)
Uplinks 435.027-.179 T B

RS-10
Downlinks 29.357 B A
29.360-.400 T A
29.403 B (Robot) A
145.857 B T/KT
145.903 B (Robot) T/KT
Uplinks 145.860-.900 T T/KT
145.820 B (Robot) T/KT

RS-12
Downlinks 29.408 B K
29.410-.450 T K
29.454 B (Robot) K
145.913 B T/KT
145.959 B (Robot) T/KT
Uplinks 21.210-.250 T K

AO-13
Downlinks 145.812 B B
145.825-.975 T B
145.985 B B (Usually off)
435.651 B L/JL
435.677 RUDAK
435.715-6.005 T L/JL
2400.664 B S
2400.711-.749 T S
Uplinks 435.423-.573 T B/S
435.601-.637 T B/S

AO-16
Downlinks 437.02625 T/B J Dig. (1200b SSB) (secondary)
437.05130 T/B J Dig. (1200b Rai. Cos SSB) (pri)
2401.14280 B 1200 bps SSB (Usually off)
Uplinks 145.900 T 1200 bps AFSK FM Digital
145.920 T 1200 bps AFSK FM Digital
145.940 T 1200 bps AFSK FM Digital
145.960 T 1200 bps AFSK FM Digital

DO-17
Downlinks 145.82438 B 1200 bps AFSK FM or Dig Voice
145.82516 B 1200 bps AFSK FM or Dig Voice
2401.22050 B 1200 bps BPSK (SSB) (usually off)
Uplinks None

WO-18
Downlink 437.10200 B 1200 bps BPSK, J Dig (Telem, Image)
Uplink None

LO-19
Downlinks 437.125 T/B J Digital (secondary)
437.127 B CW
437.154 T/B J Digital (primary)
Uplinks 145.840 T 1200 bps AFSK FM Digital
145.860 T 1200 bps AFSK FM Digital
145.880 T 1200 bps AFSK FM Digital
145.900 T 1200 bps AFSK FM Digital

FO-20
Downlinks 435.795 B J Analog
435.800-.900 T J Analog (See below)
435.910 T/B 1200 bps BPSK (SSB), J Digital
Uplinks 145.850 T 1200 bps AFSK FM Digital

145.870 T 1200 bps AFSK FM Digital
145.890 T 1200 bps AFSK FM Digital
145.910 T 1200 bps AFSK FM Digital
OR 145.900-6.00 T CW/SSB (Alternates with above
every other week. Changes on
Wednesdays)

AO-21
Downlinks 145.852-.932 T CW/SSB
145.866-.946 T CW/SSB
145.985 Repeater FM (Alternates with voice
bulletins and telemetry)
Uplinks 435.022-.102 T CW/SSB
435.601-.637 T CW/SSB
435.015 Repeater FM (See above)

UO-22
Downlink 435.120 T 9600 bps FM Digital
Uplinks 145.900 T 9600 bps FM Digital
145.975 T 9600 bps FM Digital

KO-23 (KITSAT)
Downlink 435.175 T 9600 bps FM Digital
Uplinks 145.850 T 9600 bps FM Digital
145.900 T 9600 bps FM Digital

Mir
Downlink 145.550 T/Robot (Packet mailbox. Alternates
with simplex FM voice QSOs
occasionally)

KO-25 (KITSAT-B)
Downlink 435.175/436.500 MHz 9600 bps FSK FM Digital
Uplink 145.870/145.980 MHz 9600 bps FSK FM Digital

AO-26 (ITAMSAT)
Downlink 435.867 MHz 1200 bps PSK Digital
Uplinks 145.875 MHz 1200 bps FM Digital
145.900 MHz 1200 bps FM Digital
145.925 MHz 1200 bps FM Digital
145.950 MHz 1200 bps FM Digital

AO-27 (AMRAD)
Downlink 436.798 MHz Analog FM voice/9600 bps FSK FM
Uplink 145.850 MHz Analog FM voice/9600 bps FSK FM

PO-28
Uplink 145.975 MHz JD 9600 bps FSK (Primary)
145.925 MHZ JD 9600 bps FSK (Secondary)
Downlink 435.075 MHz JD 9600 bps FSK (Primary)
435.050 MHz JD 9600 bps FSK (Secondary)
Note: PoSat will be available to all radio amateurs from January 28, 1994.

____ ____
| / /_ __\ | Disk Stephen Holmstead All comments (c)1994
| | / / /_/ | | Memory stephen@mail.boi.hp.com Opinions are mine,
|___\ / /___| Division Fax: 208/396-6858 not my employer's.

490. AMSAT Convention, When and Where

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 18:10:08 UTC
From: randyh@gvgadg.gvg.tek.com
Message-ID: <8702@gold.gvg.tek.com>
Source record: 27844

Does anyone know the dates and location, if set, of the upcoming
AMSAT convention in Orlando in October?

Randy
WA2AGE

wa2age@amsat.org
randyh@gvgadg.gvg.tek.com

491. STS-59 Delay & New Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 20:18:37 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.003.1994@ampr.org>
Source record: 27845
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT STS-59.003
STS-59 Delay & New Keps

Greenbelt, MD April 8, 1994 at 20:00 UTC

The STS-59 launch, orginally scheduled for today, has been postponed until tomorrow, April 9 at 11:05 UTC. A new set of Keplerian elements, provided by Gil Carman, WA5NOM, follow:

STS-59
1 00059U 94099.70641906 .00221188 00000-0 11303-3 0 93
2 00059 57.0053 262.7355 0009259 269.9963 90.0094 16.19806752 57

Satellite: STS-59
Catalog number: 00059
Epoch time: 94099.70641906 = (09 APR 94 16:57:14.61 UTC)
Element set: 009
Inclination: 57.0053 deg
RA of node: 262.7355 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-009
Arg of perigee: 269.9963 deg Launch: 09 APR 94 11:05 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5
Checksum: 321

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

492. Re: Greenland to Maryland?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 20:59:33 UTC
From: frank@reddik.toppoint.de
Message-ID: <1994Apr8.205933.615@reddik.toppoint.de>
Source record: 27846

mitchell@aol14.wff.nasa.gov (Richard Mitchell 1026) writes:

>Based on the great experiences of everyone here, what are the
>chances that someone in Thule, Greenland would have to talk
>to someone in Maryland via 2m/70cm satellite? Is there one
>that would be in range at both places at the same time (for
>more than, say, 2 seconds)? Is Thule to far north for anything?
>What about packet?

Try one of the satellite tracking programs like instant track.
It shows the visibility of a satellite on a map of the earth.
All stations inside this circle have the chance for a qso...

Frank

--

Frank Pliquett / frankp@toppoint.de
24114 Kiel / dg6oay @ db0oq.#slh.deu.eu

493. Re: Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 22:49:40 UTC
From: mack@ncifcrf.gov
Message-ID: <Cnyq2s.80@ncifcrf.gov>
Source record: 27847

In article <JAY.17.2DA57809@medicine.dmed.iupui.edu> JAY@medicine.dmed.iupui.edu (Jay Sissom) writes:
>I am new to satelite communications. (This is just a warning!)
>
>I would like to build a 2m & a 70cm beam for use with satelites. Does anyone
>know of an article in QST or some other plan for such antennas?

Get the ARRL &/or RSGB antenna handbooks. THe calculations for a helix are trivial. They are wideband and non-critical in dimensions, unlike a yagi.

However people don;t build them at 2m very often - they are more often used at UHF . I don't really know why but here are some guesses

A 2m helix is large and hard to support (rods out from the center pole to the helix are long).

It isn't 50 ohms. Itsa bout 140ohms and there are tricks to make it 50ohms but these are narrow band (still wide band by ham band standards) and a little tricky to get going.

Maybe you can make more money by selling a yagi than a helix.

It would beinteresting to find out the real reason, but most people if they want a fair bit of gain at 2m and 432 and want circular polarisation they use crossed beams 1/4lambda apart

>From what I understand, a normal 2m or 70cm beam antenna would work, but a
>circular polorization would be much better. I have no idea how one would
>build a circular polorized antenna.
>
>Thanks
>Jay KA9OKT
>

Joe Mack
NA3T
mack@ncifcrf.gov

494. Re: SatTrack

Newsgroup: rec.radio.amateur.space
Date: 1994-04-08 22:52:41 UTC
From: mack@ncifcrf.gov
Message-ID: <Cnyq7u.G6@ncifcrf.gov>
Source record: 27848

In article <1994Apr4.203441.4071@news.vanderbilt.edu> HEAGYWS@ctrvax.Vanderbilt.Edu () writes:
>I'm sorta new to this sat. tracking stuff but am trying to get a
>handle on it. A friend gave me a shareware copy of SatTrack to
>try out. The data file seems very old. Does anyone know where
>I could get up to data data files for SatTrack?

Use your nearest archie server. Ask someone who understands the network on your local node or go

man archie

at the prompt (if you're on a unix machine)

Joe Mack
NA3T
mack@ncifcrf.gov

495. Two-Line Orbital Element Sets (TLE373)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-09 00:06:02 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.765849962@afit.af.mil>
Source record: 27849

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #373 -
Alouette 1
1 00424U 62049 94097.17398077 .00000073 00000-0 76276-4 0 9815
2 00424 80.4665 355.0710 0022716 300.4321 59.4579 13.67805035572699
ATS 3
1 03029U 67111A 94098.17794229 -.00000121 00000-0 10000-3 0 1756
2 03029 14.6036 8.2109 0009966 275.7900 230.9355 1.00273093 96733
Cosmos 398
1 04966U 71016A 94097.75567489 .00183077 69916-5 38786-3 0 1203
2 04966 51.4479 243.9278 1089902 157.1486 208.1808 13.73211046763015
Starlette
1 07646U 75010A 94097.94728225 -.00000141 00000-0 33192-5 0 7699
2 07646 49.8236 70.5256 0206123 104.1854 258.2032 13.82185816968131
LAGEOS
1 08820U 76039A 94098.10913688 .00000030 00000-0 10000-3 0 9817
2 08820 109.8262 111.6027 0044477 300.4049 59.2194 6.38664121162671
ETS-2
1 09852U 77014A 94096.70768241 .00000056 00000-0 10000-3 0 9609
2 09852 12.0278 42.3644 0002272 355.1437 113.0291 0.99996307 9941
GOES 2
1 10061U 77048A 94089.25155824 .00000064 00000-0 10000-3 0 3129
2 10061 11.0581 46.6381 0002383 11.5975 83.7582 1.00278389 6320
IUE
1 10637U 78012A 94085.55612990 -.00000184 00000-0 10000-3 0 9862
2 10637 34.4846 96.2550 1311140 33.3880 203.2523 1.00294093 11895
GPS BI-01
1 10684U 78020A 94075.33863500 -.00000014 00000-0 10000-3 0 2598
2 10684 64.5943 48.2717 0063538 163.9849 196.2234 1.98069718103095
GPS BI-02
1 10893U 78047A 94089.39522627 .00000001 00000-0 10000-3 0 551
2 10893 63.5716 286.9513 0213668 13.4558 347.0871 2.01626741116486
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GOES 3
1 10953U 78062A 94088.42517051 .00000069 00000-0 10000-3 0 2863
2 10953 9.9885 49.4291 0004403 107.7352 9.0420 1.00292336 10927
SeaSat 1
1 10967U 78064A 94088.53479424 .00000093 00000-0 75362-4 0 2740
2 10967 108.0043 297.3897 0001440 273.9152 86.1826 14.37941137824919
GPS BI-03
1 11054U 78093A 94089.69652189 .00000003 00000-0 10000-3 0 1690
2 11054 63.2803 284.0673 0043547 175.0931 184.9611 1.93505469112998
Nimbus 7
1 11080U 78098A 94097.23361456 .00000007 00000-0 45046-4 0 3816
2 11080 99.0607 343.4781 0009009 328.3464 31.7148 13.83734817780263
GPS BI-04
1 11141U 78112 A 94 91.11675304 -.00000010 00000-0 00000+0 0 8278
2 11141 64.6339 48.8998 0048085 24.5617 335.6619 1.92894875 2296
GPS BI-05
1 11690U 80011A 94090.62653899 -.00000011 00000-0 10000-3 0 7699
2 11690 64.9365 49.6338 0140760 196.7771 162.7443 2.00553265117982
GPS BI-06
1 11783U 80032A 94097.21962746 -.00000007 00000-0 10000-3 0 9609
2 11783 62.6935 280.6042 0209698 29.2704 331.8905 2.03456890102518
GOES 5
1 12472U 81049A 94088.26421226 .00000088 00000-0 10000-3 0 7585
2 12472 6.6572 58.9992 0005254 347.4041 94.7383 1.00290290 4961
Cosmos 1383
1 13301U 82066A 94097.23391824 .00000045 00000-0 36086-4 0 2798
2 13301 82.9332 1.7821 0026451 293.2652 66.5716 13.68053541587729
LandSat 4
1 13367U 82072A 94098.22570174 .00000014 00000-0 13198-4 0 4678
2 13367 98.1865 158.0025 0008020 106.6286 253.5780 14.57126224623879
IRAS
1 13777U 83004A 94091.54410175 .00000333 00000-0 25923-3 0 5810
2 13777 98.9752 284.0846 0012230 161.2376 198.9237 13.99206647240421
Cosmos 1447
1 13916U 83021A 94088.91033243 .00000072 00000-0 60410-4 0 3783
2 13916 82.9405 70.3299 0036244 250.3266 109.3988 13.74306903552447
TDRS 1
1 13969U 83026B 94097.81857457 -.00000205 00000-0 10000-4 0 2896
2 13969 7.5693 51.8421 0003744 58.0815 105.8536 1.00275274 13343
GOES 6
1 14050U 83041A 94098.24300324 -.00000127 00000-0 10000-3 0 1889
2 14050 5.4627 61.9234 0004563 326.2329 155.1797 1.00217754 12089
OSCAR 10
1 14129U 83058B 94090.04857020 -.00000126 00000-0 10000-3 0 2727
2 14129 27.1828 334.6164 6021586 166.4731 222.3171 2.05878019 53208
LandSat 5
1 14780U 84021A 94090.16086861 .00000150 00000-0 43173-4 0 453
2 14780 98.1718 151.4456 0005629 133.9564 226.2100 14.57130862536111
UoSat 2
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1 22108U 92058A 94097.67715681 -.00000045 00000-0 10000-3 0 3872
2 22108 54.3869 260.3584 0106777 136.1580 224.6642 2.00552730 11518
FREJA
1 22161U 92064A 94097.48284107 .00000117 00000-0 10235-3 0 3881
2 22161 63.0040 111.5569 0780480 308.9336 44.4547 13.21751077 72454
LAGEOS II
1 22195U 92070B 94089.20690315 -.00000009 00000-0 10000-3 0 2765
2 22195 52.6443 143.6001 0138657 82.9823 278.6486 6.47293960 33836
GPS BIIA-16
1 22231U 92079A 94097.36737414 -.00000052 00000-0 10000-3 0 3829
2 22231 54.7287 201.8084 0031265 295.6565 64.0170 2.00561188 10081
GPS BIIA-17
1 22275U 92089A 94097.01236604 -.00000053 00000-0 10000-3 0 3916
2 22275 54.6577 199.3609 0051969 254.7355 104.7597 2.00558907 9482
TDRS 5
1 22314U 93003B 94087.95277662 -.00000293 00000-0 10000-3 0 3813
2 22314 0.9459 73.0873 0003611 296.3330 113.8127 1.00266146 4526
GPS BIIA-18
1 22446U 93007A 94086.61725673 -.00000042 00000-0 10000-3 0 3817
2 22446 54.7258 320.6359 0075607 349.4100 10.4709 2.00579043 8262
Glonass 59
1 22512U 93010A 94091.16824997 .00000039 00000-0 00000+0 0 5463
2 22512 64.8997 111.5350 0010216 208.3521 151.6346 2.13101959 8470
Glonass 60
1 22513U 93010B 94098.14756421 .00000078 00000-0 00000+0 0 5626
2 22513 64.8934 111.3190 0007316 208.2788 151.7301 2.13102387 8819
Glonass 61
1 22514U 93010C 94090.87514728 .00000039 00000-0 00000+0 0 5448
2 22514 64.9037 111.5438 0016834 202.1817 157.8116 2.13101404 8666
ASTRO-D
1 22521U 93011A 94087.73950550 .00001276 00000-0 10579-3 0 2756
2 22521 31.1038 221.1890 0076238 26.5278 333.9234 14.93094214 60065
UFO F1
1 22563U 93015A 94090.35634774 -.00000072 00000-0 10000-3 0 2736
2 22563 26.7850 300.9248 0005926 352.4946 216.3833 0.99252190 8066
GPS BIIA-19
1 22581U 93017A 94090.74317898 -.00000074 00000-0 10000-3 0 2839
2 22581 55.0808 20.7109 0046279 33.2462 327.0311 2.00570819 7403
ARSENE
1 22654U 93031B 94089.09349977 -.00000105 00000-0 00000+0 0 2486
2 22654 1.5156 104.5135 2923641 175.5080 188.1427 1.42202601 77
GPS BIIA-20
1 22657U 93032A 94086.88798788 -.00000067 00000-0 10000-3 0 2844
2 22657 55.0808 20.6534 0064657 167.8998 192.2265 2.00560970 2655
RADCAL
1 22698U 93041A 94097.58285642 .00000124 00000-0 48576-4 0 2829
2 22698 89.5525 313.0425 0094074 57.4976 303.5263 14.21305241 40563
GPS BIIA-21
1 22700U 93042A 94086.35388711 -.00000001 00000-0 10000-3 0 2801
2 22700 54.5782 261.5342 0025557 320.2461 39.5324 2.00574385 5442
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NOAA 13
1 22739U 93050A 94090.91780500 .00000012 00000-0 31683-4 0 3860
2 22739 98.9403 35.6379 0009998 345.1933 14.8940 14.10888401 33067
GPS BIIA-22
1 22779U 93054A 94089.93691484 -.00000063 00000-0 10000-3 0 3024
2 22779 54.8328 320.4269 0022046 229.1427 130.7178 2.00567209 4277
Meteor 2-21
1 22782U 93055A 94097.90171581 .00000029 00000-0 13238-4 0 2876
2 22782 82.5448 262.1275 0024035 62.7370 297.6240 13.83003360 30378
UFO F2
1 22787U 93056A 94088.94335856 -.00000089 00000-0 10000-3 0 2693
2 22787 4.9046 323.2891 0004109 28.1377 247.3895 1.00273616 454
SPOT 3
1 22823U 93061A 94087.75604844 .00000169 00000-0 10000-3 0 2861
2 22823 98.7244 163.4396 0001997 87.9722 272.1682 14.20032485 26078
STELLA
1 22824U 93061B 94090.22561677 -.00000042 00000-0 70098-6 0 2748
2 22824 98.6603 166.7266 0007152 72.8782 287.3179 14.27095664 26554
AO-27
1 22825U 93061C 94090.23004933 .00000064 00000-0 43978-4 0 2745
2 22825 98.6599 166.8062 0009628 75.4070 284.8171 14.27615820 26560
IO-26
1 22826U 93 61 D 94 91.19784889 .00000088 00000-0 43901-4 0 2547
2 22826 98.6602 167.7921 0010130 73.4481 286.7832 14.27718831 26701
HEATHSAT
1 22827U 93061E 94097.70144726 .00000077 00000-0 48920-4 0 3388
2 22827 98.6554 174.2073 0010347 42.8864 317.3125 14.27828186 27638
PO-28
1 22829U 93061G 94098.23630497 .00000067 00000-0 44725-4 0 2695
2 22829 98.6552 174.7792 0011042 43.2925 316.9112 14.28016869 27715
KO-25
1 22830U 93061H 94098.16232175 .00000083 00000-0 50860-4 0 2796
2 22830 98.5601 172.6843 0012451 25.4816 334.6987 14.28045473 27700
GPS BIIA-23
1 22877U 93068A 94095.97512170 .00000020 00000-0 10000-3 0 976
2 22877 55.1713 81.3253 0035324 286.5318 73.0839 2.00581008 3289
METEOSAT 6
1 22912U 93073B 94089.33548897 -.00000104 00000-0 00000+0 0 755
2 22912 1.0635 268.2432 0000420 40.5206 349.3082 1.00272779 1378
HST Array
1 22920U 90037C 94090.16401805 .00010816 00000-0 93057-3 0 1109
2 22920 28.4705 12.3788 0004202 166.7015 193.3685 14.95880822 17792
Soyuz TM-18
1 22957U 94001A 94096.79130926 .00020437 00000-0 26669-3 0 858
2 22957 51.6461 184.1091 0015342 115.1963 245.0516 15.58535572 13839
Meteor 3-6
1 22969U 94003A 94090.50362011 -.00000248 00000-0 -68034-3 0 445
2 22969 82.5590 111.0754 0017027 96.6658 263.6405 13.16716743 8626
TUBSAT-B
1 22970U 94003B 94089.51068514 -.00000099 00000-0 -29027-3 0 338
```

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2 22970 82.5609 111.7705 0017591 97.5016 262.8070 13.16819282 8492
1994004C
1 22987U 94004 C 94055.87598242 .00000000 00000-0 00000+0 0 72
2 22987 065.8116 060.4024 9032818 202.5029 045.6815 00.46820501000133
ODERACS A
1 22990U 94006B 94089.66594342 .00058622 00000-0 30676-3 0 393
2 22990 56.9835 326.4877 0020073 21.1636 338.8851 15.80066879 7720
ODERACS B
1 22991U 94006C 94097.90344860 .00061696 00000-0 31389-3 0 463
2 22991 56.9865 289.1395 0018692 37.9106 322.3133 15.80700570 9024
ODERACS E
1 22994U 94006F 94089.85901713 .00031098 00000-0 19187-3 0 383
2 22994 56.9883 326.3161 0019351 28.0739 332.1370 15.76710846 7749
ODERACS F
1 22995U 94006G 94097.72152570 .00032753 00000-0 19720-3 0 470
2 22995 56.9913 290.7389 0018854 41.7965 318.4171 15.77250414 8984
BREMSAT
1 22998U 94006H 94097.69890674 .00037564 00000-0 23630-3 0 293
2 22998 56.9905 291.2903 0016612 61.0108 299.2562 15.76246698 8821
GPS BIIA-24
1 23027U 94016A 94091.11386548 -.00000073 00000-0 63223-3 0 231
2 23027 54.9197 22.6364 0064053 198.4998 161.2852 2.01523854 577
SEDS 2
1 23028U 94016B 94091.52628891 .00231312 00000-0 10530-2 0 241
2 23028 32.3497 201.4170 0003463 41.9335 318.1603 15.82118896 3511
1994016C
1 23029U 94016C 94097.00373561 .00101898 33354-6 18157-2 0 479
2 23029 34.8989 356.8345 6027051 221.4766 72.1797 4.09299175 1215
Cosmos 2274
1 23033U 94018A 94098.02516580 .00422853 56710-5 23688-3 0 540
2 23033 67.1249 336.9756 0136401 90.6703 265.1168 16.01350774 3434
ProgressM22
1 23035U 94019A 94098.13780813 .00023804 00000-0 30911-3 0 262
2 23035 51.6461 177.3513 0015651 120.4366 239.6443 15.58555204 2660
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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496. Re: Motorola GPS engine group purchase update

Newsgroup: rec.radio.amateur.space
Date: 1994-04-09 02:07:05 UTC
From: j.perry@lynx.dac.neu.edu
Message-ID: <2o52k9$8tr@lynx.dac.neu.edu>
Source record: 27850

I too may be interested in this purchase....please email me with info on
the
price when you get it.

N1ILY

--

Jeffrey Perry
j.perry@lynx.dac.neu.edu

497. STS-59 Update 4/9 at 14:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-04-09 09:28:54 UTC
From: ka3hdo@wa3nan.AmSaT.Org
Message-ID: <$sts-59.004.1994@ampr.org>
Source record: 27851
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.004
STS-59 SAREX Mission Underway

Greenbelt, MD April 9, 1994 at 12:00 UTC

The Space Shuttle Endeavour rose into the early morning skies of the Kennedy Space Center this morning, initiating the flight of STS-59. The spectacular, on-time launch occurred precisely at 11:05 UTC (7:05 EDT). Therefore, element set JSC-009, distributed yesterday, should be valid for the first flight day. For your convenience, this element set is provided below.

The Shuttle Amateur Radio Experiment (SAREX) was activated approximately 3 hours after liftoff with an excellent check pass through San Diego. Kerry Banke, N6IZW and Ron Earl, W6TXK, in San Diego used a phone link to connect Jay Apt, N5QWL on the Space Shuttle Endeavour with Lou McFadin, W5DID at the Johnson Space Center. The SAREX equipment appears in good shape and ready for packet operations. During the contact, Jay Apt said he really enjoyed the magnificent ride into space. More details will follow as they become available.

STS-59
1 00059U 94099.70641906 .00221188 00000-0 11303-3 0 93
2 00059 57.0053 262.7355 0009259 269.9963 90.0094 16.19806752 57

Satellite: STS-59
Catalog number: 00059
Epoch time: 94099.70641906 = (09 APR 94 16:57:14.61 UTC)
Element set: 009
Inclination: 57.0053 deg
RA of node: 262.7355 deg Space Shuttle Flight STS-59
Eccentricity: .0009259 Prelaunch Element set JSC-009
Arg of perigee: 269.9963 deg Launch: 09 APR 94 11:05 UTC
Mean anomaly: 90.0094 deg
Mean motion: 16.19806752 rev/day G. L. Carman
Decay rate: 2.21188e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 5
Checksum: 321

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX

498. ARLS016 SAREX Mission STS-59

Newsgroup: rec.radio.amateur.space
Date: 1994-04-09 14:18:58 UTC
From: marcbg@netcom.com
Message-ID: <$arls016.1994@ampr.org>
Source record: 27852
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS016
ARLS016 SAREX Mission STS-59

ZCZC AS60
QST de W1AW
Space Bulletin 016 ARLS016
>From ARRL Headquarters
Newington, CT April 7, 1994
To all radio amateurs

SB SPACE ARL ARLS016
ARLS016 SAREX Mission STS-59

SAREX Mission STS-59

The Johnson Space Center Amateur Radio Club will manage a small dial-in telephone BBS during the upcoming SAREX Shuttle mission. The BBS will have the latest Keplerian element sets available during the flight. The number is 713- 244-5625, 9600 baud or less.

Additional Shuttle mission information will be available throughout the flight from the NASA Spacelink computer bulletin board. To reach the bulletin board, dial 205-895-0028, or on internet use the address spacelink.msfc.nasa.gov.

The flight is scheduled to launch at 1206 UTC on Friday, April 8. Amateur Radio licensed crewmembers Jay Apt, N5QWL, and Linda Godwin, N5RAX, will operate the Shuttle Amateur Radio EXperiment. Apt is the commander of the Blue Shift and will operate the shuttle systems during the ''night'' shift, while Godwin is responsible for overall operation of three large radars in the shuttle's cargo bay during the ''day'' shift. They will operate both FM voice and packet during the mission.

Keep posted to W1AW bulletins for additional SAREX information and updated Keplerian element sets throughout the flight.

Thank to Gil Carman, WA5NOM, and the Johnson Space Center Newsroom for the preceding information.
NNNN
/EX

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Marc B. Grant Voice Mail: 214-246-1150
marcbg@netcom.com Amateur Radio N5MEI

marcbg@esy.com Computer & Information Security
==========

499. ARLS017 Shuttle launch delayed

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 00:57:02 UTC
From: owner-w1aw-list@netcom.com
Message-ID: <$arls017.1994@ampr.org>
Source record: 27853
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SPACE @ ARL $ARLS017
ARLS017 Shuttle launch delayed

ZCZC AS61
QST de W1AW
Space Bulletin 017 ARLS017
From ARRL Headquarters
Newington, CT April 8, 1994
To all radio amateurs

SB SPACE ARL ARLS017
ARLS017 Shuttle launch delayed

Shuttle Launch Postponed 1 Day

Friday morning's scheduled launch of the Space Shuttle
Endeavour has been postponed due to weather constraints
until Saturday, April 9 at 1105 UTC.

This mission, designated STS-59, carries the Shuttle
Amateur Radio EXperiment or SAREX. Astronaut Jay Apt,
N5QWL, will try to activate SAREX about 3 hours into the
mission. Stay tuned to W1AW for additional launch and
mission information.
NNNN
/EX
```

500. ORBS098.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 06:48:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-098.w.1994@ampr.org>
Source record: 27854
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-098.W
Orbital Elements 098.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX April 8, 1994
BID: $ORBS-098.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94096.96691714
Element set: 774
Inclination: 99.0631 deg
RA of node: 146.5985 deg
Eccentricity: 0.0016149
Arg of perigee: 62.1791 deg
Mean anomaly: 298.1005 deg
Mean motion: 14.13604747 rev/day
Decay rate: 1.04e-06 rev/day^2
Epoch rev: 48028
Checksum: 329

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94096.95319952
Element set: 673
Inclination: 98.5122 deg
RA of node: 108.1277 deg
Eccentricity: 0.0012929
Arg of perigee: 173.0330 deg
Mean anomaly: 187.1032 deg
Mean motion: 14.24877528 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 39246
Checksum: 326

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94093.66879616
Element set: 276
Inclination: 82.5429 deg
RA of node: 327.8717 deg
Eccentricity: 0.0018087
Arg of perigee: 33.1391 deg
```

Mean anomaly: 327.0888 deg
Mean motion: 13.84712948 rev/day
Decay rate: 7.2e-07 rev/day^2
Epoch rev: 31204
Checksum: 340

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94089.83574800
Element set: 272
Inclination: 82.5443 deg
RA of node: 19.1260 deg
Eccentricity: 0.0018339
Arg of perigee: 97.2779 deg
Mean anomaly: 263.0433 deg
Mean motion: 13.16965918 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27294
Checksum: 324

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94083.23885812
Element set: 572
Inclination: 99.1670 deg
RA of node: 70.0925 deg
Eccentricity: 0.0012545
Arg of perigee: 15.7107 deg
Mean anomaly: 344.4450 deg
Mean motion: 14.12969487 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 28322
Checksum: 300

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94093.77791533
Element set: 275
Inclination: 82.5203 deg
RA of node: 203.2318 deg
Eccentricity: 0.0015846
Arg of perigee: 76.3600 deg
Mean anomaly: 283.9325 deg
Mean motion: 13.84360581 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 25739
Checksum: 316

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94096.89802122

Element set: 19
Inclination: 82.5496 deg
RA of node: 319.2682 deg
Eccentricity: 0.0006914
Arg of perigee: 92.4930 deg
Mean anomaly: 267.6966 deg
Mean motion: 13.04406356 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21360
Checksum: 303

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94092.98290424
Element set: 777
Inclination: 82.5407 deg
RA of node: 268.1974 deg
Eccentricity: 0.0016849
Arg of perigee: 2.5004 deg
Mean anomaly: 357.6234 deg
Mean motion: 13.84189785 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 19021
Checksum: 326

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94096.57359175
Element set: 935
Inclination: 98.8347 deg
RA of node: 118.9912 deg
Eccentricity: 0.0013640
Arg of perigee: 203.7746 deg
Mean anomaly: 156.2787 deg
Mean motion: 14.01311548 rev/day
Decay rate: -2.9e-07 rev/day^2
Epoch rev: 18367
Checksum: 340

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94094.25698003
Element set: 786
Inclination: 82.5246 deg
RA of node: 204.7890 deg
Eccentricity: 0.0011958
Arg of perigee: 255.0900 deg
Mean anomaly: 104.8936 deg
Mean motion: 13.83576540 rev/day
Decay rate: 8.0e-07 rev/day^2
Epoch rev: 17753

Checksum: 319

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94093.84087512
Element set: 684
Inclination: 82.5414 deg
RA of node: 222.1406 deg
Eccentricity: 0.0013588
Arg of perigee: 17.3282 deg
Mean anomaly: 342.8306 deg
Mean motion: 13.16460528 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14157
Checksum: 280

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94093.55971056
Element set: 989
Inclination: 98.6259 deg
RA of node: 122.9593 deg
Eccentricity: 0.0014150
Arg of perigee: 91.5218 deg
Mean anomaly: 268.7581 deg
Mean motion: 14.22387096 rev/day
Decay rate: 1.46e-06 rev/day^2
Epoch rev: 14992
Checksum: 338

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94097.16784425
Element set: 692
Inclination: 82.5566 deg
RA of node: 166.8994 deg
Eccentricity: 0.0014492
Arg of perigee: 19.2230 deg
Mean anomaly: 340.9434 deg
Mean motion: 13.16829137 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12711
Checksum: 319

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94093.48854630
Element set: 286
Inclination: 82.5455 deg
RA of node: 265.6275 deg
Eccentricity: 0.0023942

```
Arg of perigee: 74.0584 deg
Mean anomaly: 286.3202 deg
Mean motion: 13.83003079 rev/day
Decay rate: 1.5e-07 rev/day^2
Epoch rev: 2976
Checksum: 313

/EX
```

501. STS-59 Orbital State Vector Rev #3

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 07:20:53 UTC
From: astroman@netcom.com
Message-ID: <astromanCo18Et.It9@netcom.com>
Source record: 27855
Cross-posted to: sci.space,shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94099.79993364583
04/09/1994 19:11:54.266 UTC
ECI X: 1962058.780865 ft
M50 Y: 21484713.816461 ft
Z: -1774126.216191 ft
Xdot: -14127.89453 ft/s
Ydot: -465.13477 ft/s
Zdot: -21236.40625 ft/s
ndot/2 (drag): 0.00221188000 rev/day^2
nddt/6: 0.00000E+00 rev/day^3
Bstar: 1.13030E-04 1/Earth Radii
Elset #: 3
Rev @ Epoch: 6.51552982551

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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502. OSCAR MODE S

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 08:40:56 UTC
From: wb8k@barf80.nshore.org
Message-ID: <Xy6Jkc1w165w@barf80.nshore.org>
Source record: 27856

Anyone know of an inexpensive (less that the $300+ commercial converters)
way to get on Mode S. How about converting some of the TVRO LNA/B's down
in freq??

Dennis jakubisin
InterNet: wb8k@barf80.nshore.org
Basic Amateur Radio Frequency, BARF-80 +1 216/237-8208
"Totally devoted to Amateur Radio" - 24 Hrs a day 8/N/1 14.4k-300 baud

503. Oscar Antennas ??

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 08:43:16 UTC
From: wb8k@barf80.nshore.org
Message-ID: <T36Jkc2w165w@barf80.nshore.org>
Source record: 27857

What the latest gossip concerning what good & what isn't on Oscar yagi's
for mode B & J.. KLM, M sqrd etc. Any comments?? The old Cushcraft AOP 1
pkg I have been using for a few years rally barks, especially in wet
weather.
/e

Dennis jakubisin
InterNet: wb8k@barf80.nshore.org
Basic Amateur Radio Frequency, BARF-80 +1 216/237-8208
"Totally devoted to Amateur Radio" - 24 Hrs a day 8/N/1 14.4k-300 baud

504. Re: HELP: my satellite program won't work

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 09:09:53 UTC
From: manfred@isi5.ssl.berkeley.edu
Message-ID: <2o8fp1$ieq@agate.berkeley.edu>
Source record: 27858

> Anyway, I downloaded the program sattrack for my UNIX box at home and
> compiled it under linux. Everything went okay until I tried the
> program. The program kept on telling me that the satellites have
> "crashed already".

> I tried AO-21, Mir and Oscar 13, they all gave me the same result, and
> I know, for a fact, that the satellites have not been crashed :-).

> Please help me, thanks in advance.

> 73 de KE6BCU, Benjie

What you have is SatTrack V1.0. This version was the very first version and was meant to be distributed locally in Berkeley and Stanford for testing purposes only and is known to have bugs. Since then there have been many upgrades and modifications. The last publicly released version of SatTrack is V1.7. Bob Kupiec was kind enough to provide an FTP site from which it can be obtained. It's now available on ftp.jvnc.net in /priv/kupiec.

Uncompress the distribution file by typing:

uncompress sattrack.V1.7.tar.Z

Then unbundle the distribution file by typing

tar xvpf sattrack.V1.7.tar

If SatTrack is compiled on a Linux machine with a Gnu C compiler, the Makefile needs to be changed. Replace the 'cc' everywhere with 'gcc'. This worked fine on a Toshiba T4600C laptop with Linux.

SatTrack has no graphics, but a live display mode and orbit prediction features. In the meantime, I spent quite some more time to work on the program and also incorporated numerous suggestions from users all over the world. The new version (V2.0) is not quite ready to be publicly released, but I hope I can check the program some more during the next six weeks or so. It will feature the SGP4/SDP4 NOARD models, a live display for a single satellite as well as a live display for multiple satellites (as many as the computing power of the machine it runs on allows), a batch mode with arguments passed on the command line, and the orbit prediction capabilities that V1.7 had. There are more improvements like the calculation of squint angles (for AO-10 and AO-13), and also some subroutines that allow control of ground station equipment, like radios and antenna controllers. The framework for the latter are part of SatTrack V2.0 and easily be configured by the user for specific hardware.

Stay tuned...

(Remark: There is a program SatTrack for PCs which has nothing to do with this Unix/C program. Two different programs from two different authors.)

73, Manfred --- W6/DL5KR

Manfred Bester
Space Sciences Lab
University of California at Berkeley
(510) 642-8497
manfred@ssl.berkeley.edu

505. Shuttle Rise/Set Times 4/10

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 12:16:47 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.005.1994@ampr.org>
Source record: 27859
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.005
STS-59 Eastern R/S Times 04/10

Below are the rise and set times for STS-59 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

New York City STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:24:33 12:27:47 12:30 9 A-W 18
10Apr94 17:04:35 17:07:38 17:10 7 D-E 21
10Apr94 18:36:02 18:39:56 18:43 74 D-W 22

11Apr94 10:33:28 10:37:15 10:40 47 A-E 33
11Apr94 12:06:24 12:09:32 12:12 8 A-W 34
11Apr94 16:46:14 16:49:23 16:52 7 D-E 37
11Apr94 18:17:45 18:21:39 18:25 60 D-W 38

12Apr94 10:14:45 10:18:33 10:21 58 A-E 49
12Apr94 11:47:47 11:50:52 11:53 8 A-W 50
12Apr94 16:27:30 16:30:44 16:33 8 D-E 53
12Apr94 17:59:03 18:02:57 18:06 49 D-W 54

Washington D.C. STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:23:52 12:27:02 12:29 9 A-W 18
10Apr94 18:35:59 18:39:53 18:43 41 D-E 22

11Apr94 10:32:47 10:36:33 10:39 40 A-E 33
11Apr94 12:05:43 12:08:47 12:11 8 A-W 34

11Apr94 18:17:41 18:21:35 18:24 50 D-E 38

12Apr94 10:14:03 10:17:50 10:21 48 A-E 49
12Apr94 11:47:07 11:50:07 11:52 7 A-W 50
12Apr94 17:58:59 18:02:54 18:06 61 D-E 54

Atlanta, GA STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:21:51 12:24:54 12:27 8 A-W 18
10Apr94 18:36:42 18:39:40 18:42 6 D-E 22
10Apr94 20:08:00 20:11:47 20:15 28 D-W 23

11Apr94 10:30:52 10:34:32 10:37 25 A-E 33
11Apr94 12:03:44 12:06:39 12:09 7 A-W 34
11Apr94 18:18:19 18:21:25 18:24 7 D-E 38
11Apr94 19:49:45 19:53:29 19:56 23 D-W 39

12Apr94 10:12:07 10:15:49 10:19 30 A-E 49
12Apr94 11:45:09 11:47:59 11:50 6 A-W 50
12Apr94 17:59:33 18:02:45 18:05 8 D-E 54
12Apr94 19:31:05 19:34:47 19:37 19 D-W 55

Miami, FL STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 20:10:08 20:13:57 20:17 42 D-W 23

11Apr94 10:29:46 10:33:27 10:36 28 A-W 33
11Apr94 19:51:52 19:55:39 19:58 32 D-W 39

12Apr94 10:11:07 10:14:46 10:17 23 A-W 49
12Apr94 19:33:12 19:36:57 19:40 26 D-W 55

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.006
STS-59 Central R/S Times 04/10

Below are the rise and set times for STS-59 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
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local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon

geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Chicago, IL STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:21:59 12:25:48 12:29 51 A-W 18
10Apr94 13:55:35 13:58:20 14:00 5 A-W 19
10Apr94 18:34:06 18:37:49 18:41 18 D-E 22
10Apr94 20:06:10 20:09:44 20:12 15 D-W 23

11Apr94 10:33:09 10:35:55 10:38 5 A-E 33
11Apr94 12:03:43 12:07:31 12:10 42 A-W 34
11Apr94 13:37:26 13:40:06 13:42 5 A-W 35
11Apr94 18:15:47 18:19:33 18:22 20 D-E 38
11Apr94 19:47:56 19:51:25 19:54 13 D-W 39

12Apr94 10:14:19 10:17:11 10:19 6 A-E 49
12Apr94 11:45:02 11:48:50 11:52 36 A-W 50
12Apr94 17:57:04 18:00:52 18:04 22 D-E 54
12Apr94 19:29:17 19:32:42 19:35 11 D-W 55

Huntsville, AL STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:21:20 12:24:43 12:27 12 A-W 18
10Apr94 18:36:15 18:39:08 18:41 6 D-E 22
10Apr94 20:07:28 20:11:18 20:14 36 D-W 23

11Apr94 10:30:59 10:34:29 10:37 15 A-E 33
11Apr94 12:03:11 12:06:27 12:09 10 A-W 34
11Apr94 18:17:51 18:20:53 18:23 6 D-E 38
11Apr94 19:49:12 19:53:00 19:56 29 D-W 39

12Apr94 10:12:13 10:15:46 10:18 18 A-E 49
12Apr94 11:44:34 11:47:47 11:50 9 A-W 50
12Apr94 17:59:06 18:02:13 18:04 7 D-E 54
12Apr94 19:30:32 19:34:17 19:37 24 D-W 55

Houston, TX STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:18:54 12:22:28 12:25 18 A-W 18
10Apr94 20:07:29 20:11:06 20:14 15 D-E 23
10Apr94 21:39:55 21:42:52 21:45 7 D-W 24

11Apr94 10:29:32 10:32:26 10:34 7 A-E 33
11Apr94 12:00:43 12:04:12 12:07 15 A-W 34
11Apr94 19:49:08 19:52:49 19:56 18 D-E 39
11Apr94 21:21:49 21:24:33 21:26 5 D-W 40

12Apr94 10:10:41 10:13:43 10:16 8 A-E 49
12Apr94 11:42:05 11:45:31 11:48 13 A-W 50
12Apr94 19:30:24 19:34:07 19:37 21 D-E 55

Denver, CO STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 13:51:31 13:55:07 13:58 17 A-W 19
10Apr94 20:04:02 20:07:49 20:11 22 D-E 23
10Apr94 21:36:21 21:39:38 21:42 10 D-W 24

11Apr94 12:01:25 12:04:55 12:07 15 A-E 34
11Apr94 13:33:19 13:36:51 13:39 15 A-W 35
11Apr94 19:45:43 19:49:32 19:52 25 D-E 39
11Apr94 21:18:10 21:21:19 21:23 8 D-W 40

12Apr94 11:42:38 11:46:12 11:49 17 A-E 50
12Apr94 13:14:41 13:18:11 13:21 14 A-W 51
12Apr94 19:27:00 19:30:51 19:34 28 D-E 55
12Apr94 20:59:33 21:02:35 21:05 7 D-W 56

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.007
STS-59 Western R/S Times 04/10

Below are the rise and set times for STS-59 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

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set = time that shuttle disappears below horizon
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D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Seattle, WA STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 13:51:06 13:54:17 13:56 9 A-E 19
10Apr94 15:22:07 15:25:58 15:29 49 A-W 20
10Apr94 16:55:04 16:58:27 17:01 11 A-W 21
10Apr94 18:28:05 18:31:19 18:34 8 D-E 22
10Apr94 20:00:13 20:03:59 20:07 20 D-E 23

10Apr94 21:32:13 21:36:02 21:39 27 D-W 24

11Apr94 13:32:40 13:35:58 13:38 10 A-E 35
11Apr94 15:03:51 15:07:41 15:11 43 A-W 36
11Apr94 16:36:51 16:40:12 16:43 10 A-W 37
11Apr94 18:09:50 18:13:04 18:15 8 D-E 38
11Apr94 19:41:56 19:45:43 19:49 22 D-E 39
11Apr94 21:13:57 21:17:44 21:21 24 D-W 40

12Apr94 13:13:54 13:17:15 13:20 12 A-E 51
12Apr94 14:45:10 14:49:00 14:52 38 A-W 52
12Apr94 16:18:11 16:21:32 16:24 10 A-W 53
12Apr94 17:51:09 17:54:25 17:57 9 D-E 54
12Apr94 19:23:13 19:27:03 19:30 23 D-E 55
12Apr94 20:55:16 20:59:01 21:02 21 D-W 56

Albuquerque, NM STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:18:28 12:22:03 12:25 18 A-E 18
10Apr94 13:50:52 13:54:04 13:56 9 A-W 19
10Apr94 20:05:08 20:08:22 20:11 8 D-E 23
10Apr94 21:36:42 21:40:25 21:43 21 D-W 24

11Apr94 12:00:06 12:03:44 12:06 22 A-E 34
11Apr94 13:32:43 13:35:49 13:38 8 A-W 35
11Apr94 19:46:46 19:50:06 19:52 9 D-E 39
11Apr94 21:18:28 21:22:07 21:25 18 D-W 40

12Apr94 11:41:21 11:45:01 11:48 26 A-E 50
12Apr94 13:14:08 13:17:09 13:19 7 A-W 51
12Apr94 19:28:01 19:31:26 19:34 11 D-E 55
12Apr94 20:59:48 21:03:24 21:06 15 D-W 56

Los Angeles, CA STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 13:48:21 13:52:07 13:55 38 A-W 19
10Apr94 21:35:15 21:39:05 21:42 29 D-E 24

11Apr94 13:30:06 13:33:50 13:37 31 A-W 35
11Apr94 21:16:56 21:20:47 21:24 35 D-E 40

12Apr94 13:11:26 13:15:09 13:18 26 A-W 51
12Apr94 20:58:13 21:02:06 21:05 42 D-E 56

Honolulu, HI STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 15:12:23 15:16:05 15:19 39 A-E 20

11Apr94 00:36:28 00:39:50 00:42 10 D-E 26
11Apr94 02:08:42 02:11:37 02:14 7 D-W 27
11Apr94 14:54:03 14:57:47 15:01 52 A-E 36

12Apr94 00:17:42 00:21:08 00:24 12 D-E 42
12Apr94 01:50:08 01:52:54 01:55 5 D-W 43
12Apr94 14:35:20 14:39:05 14:42 70 A-E 52
12Apr94 23:59:38 00:03:11 00:06 15 D-E 58

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.008
STS-59 World R/S Times 04/09

Below are the rise and set times for STS-59 for selected worldwide cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
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local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

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set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

London, England STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:36:36 12:40:31 12:43 57 D-W 18
10Apr94 14:09:16 14:12:03 14:14 5 D-W 19

11Apr94 06:09:51 06:13:25 06:16 16 A-E 30
11Apr94 07:41:21 07:45:13 07:48 48 A-W 31
11Apr94 09:13:55 09:17:37 09:20 18 D-W 32
11Apr94 10:46:17 10:50:07 10:53 24 D-E 33
11Apr94 12:18:19 12:22:14 12:25 50 D-W 34
11Apr94 13:51:05 13:53:44 13:55 5 D-W 35

12Apr94 05:51:06 05:54:42 05:57 17 A-E 46
12Apr94 07:22:40 07:26:32 07:29 44 A-W 47
12Apr94 08:55:14 08:58:57 09:02 18 D-W 48
12Apr94 10:27:35 10:31:26 10:34 25 D-E 49
12Apr94 11:59:37 12:03:32 12:06 44 D-W 50

Paris, France STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 12:37:04 12:41:00 12:44 55 D-W 18

11Apr94 06:09:49 06:13:32 06:16 24 A-E 30
11Apr94 07:41:41 07:45:30 07:48 30 A-W 31
11Apr94 09:14:25 09:18:01 09:21 15 D-W 32
11Apr94 10:46:47 10:50:35 10:53 22 D-E 33
11Apr94 12:18:48 12:22:42 12:26 47 D-W 34

12Apr94 05:51:05 05:54:50 05:58 26 A-E 46
12Apr94 07:23:00 07:26:49 07:30 28 A-W 47
12Apr94 08:55:44 08:59:21 09:02 14 D-W 48
12Apr94 10:28:05 10:31:54 10:35 23 D-E 49
12Apr94 12:00:06 12:04:00 12:07 42 D-W 50

Tokyo, Japan STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 19:42:55 19:46:23 19:49 15 A-E 23
10Apr94 21:14:59 21:18:21 21:21 11 A-W 24

11Apr94 03:28:54 03:32:07 03:34 8 D-E 28
11Apr94 05:00:27 05:04:11 05:07 24 D-W 29
11Apr94 19:24:31 19:28:04 19:31 17 A-E 39
11Apr94 20:56:49 21:00:05 21:02 10 A-W 40

12Apr94 03:10:09 03:13:27 03:16 9 D-E 44
12Apr94 04:41:47 04:45:29 04:48 20 D-W 45
12Apr94 19:05:45 19:09:21 19:12 20 A-E 55
12Apr94 20:38:13 20:41:25 20:44 9 A-W 56

Sydney, Australia STS-59 Element Set JSC-009

date rise tca set el geo orbit

10Apr94 14:54:31 14:57:18 14:59 5 A-E 19
10Apr94 16:25:42 16:29:25 16:32 31 A-W 20

11Apr94 06:48:47 06:52:21 06:55 20 D-E 30
11Apr94 08:21:26 08:24:25 08:26 7 D-W 31
11Apr94 14:36:07 14:39:02 14:41 6 A-E 35
11Apr94 16:07:27 16:11:07 16:14 25 A-W 36

12Apr94 06:30:01 06:33:38 06:36 24 D-E 46
12Apr94 08:02:50 08:05:45 08:08 6 D-W 47
12Apr94 14:17:21 14:20:23 14:22 7 A-E 51
12Apr94 15:48:47 15:52:25 15:55 21 A-W 52

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

506. SAREX Update & Keps 4/10/94

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 16:17:33 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-059.009.1994@ampr.org>
Source record: 27860
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.009
SAREX Update & Keps 4/10/94

Greenbelt, MD, April 10, 1994 at 16:00 UTC

After the successful check pass yesterday, the SAREX Working Group has had several reports of packet radio operation and some general voice QSO operation during the Shuttle passes over the U.S. In addition, the St. Bernard High School in Playa Del Rey, CA had a very excellent school group pass this morning (Rev 19). A total of seven questions were asked by the students.

The official SAREX element set for today will be GSFC-007. This element sent was generated by Ron Parise, WA4SIR of the Goddard Space Flight Center. Gil Carman, WA5NOM reports that the predictions using GSFC-007 differed from JSC-009 by approximately 20 seconds. GSFC-007 follows:

STS-59
1 23042U 94020A 94100.26164012 0.00018681 11051-4 10679-4 0 75
2 23042 56.9969 260.0497 0009381 274.0340 85.9677 16.20558915 145

Satellite: STS-59
Catalog number: 23042
Epoch time: 94100.26164012 (10 APR 94 06:16:45.71 UTC)
Element set: GSFC-007
Inclination: 56.9969 deg
RA of node: 260.0497 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009381 Keplerian Elements
Arg of perigee: 274.0340 deg
Mean anomaly: 85.9677 deg
Mean motion: 16.20558915 rev/day Semi-major Axis: 6596.1671 Km
Decay rate: 0.19E-03 rev/day*2 Apogee Alt: 223.97 Km
Epoch rev: 14 Perigee Alt: 211.59 Km

NOTE - This element set is based on NORAD element set # 007.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

507. 2 Line ElSets

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 17:57:56 UTC
From: leeannmyk@aol.COM
Message-ID: <9404101357.tn603757@aol.com>
Source record: 27711

Hello, My name is Mike Johnson. I am looking for a source for
USSPACECMD/NORAD type 2 line element sets for a varity of vehicles (primarily
16609).

Any help in finding this (these) source(s) would be greatly appreciated.
I can also be contacted at johnsonm@Rush.aps.rl.af.mil

Thank you for your time.

73 N7WBO

508. ANS-099 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 22:25:51 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-099.01.1994@ampr.org>
Source record: 27712
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-099.01
W5RRR/JSC ARC LANDLINE BBS

HR AMSAT NEWS SERVICE BULLETIN 099.01 FROM AMSAT HQ
SILVER SPRING, MD APRIL 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-099.01

New Landline BBS Provides STS-59 SAREX Information

The Johnson Space Center Amateur Radio Club has set up a telephone computer bulletin board (BBS). The purpose of the BBS is to provide a source of current Space Shuttle mission Keplerian Elements.

There are limited number of BBS files available for downloading. Among the current files are:

o Current and old element sets for the mission in progress
o Current mission information
o Shuttle Amateur Radio Experiment (SAREX) information
o Recent Space Shuttle Mission Schedules and Manifests
o Astronaut/Cosmonaut Ham List
o Current JSC Amateur Radio Club Newsletter

We ask that no files be uploaded to the BBS. The telephone number is (713) 244-5625. Our modem can handle all bauds up to and including 9600 baud. The parameters are N-8-1.

The BBS is currently running in ProComm HOST mode, so the logon is very simple and downloading is easy. After logging in, you will see the Welcome Screen describing the BBS. Also, the Welcome Screen contains the current and latest element set number (e.g., JSC008) loaded on the BBS. Check it against your last set so you won't waste your time duplicating a set you already have. Press ENTER to bring up the second page containing the current Space Shuttle Keplerian Element Set. If you have a file capture or screen capture function in your communications software, then you should use it for this page. That way, you won't have to go through the file download process if all you wanted was the latest element set. If you have any comments for the Club or BBS sysop, leave a message and we will respond.

[The AMSAT News Service would like to thank Dale Martin (KG5U), KG5U @ KA5KTH.#setx.tx.usa.na, Secretary of the Johnson Space Center ARC Houston, Texas (W5RRR)]

/EX
SB SAT @ AMSAT $ANS-099.02
FUJI AWARD PROGRAM DETAILS

HR AMSAT NEWS SERVICE BULLETIN 099.02 FROM AMSAT HQ
SILVER SPRING, MD APRIL 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-099.02

JJ1WTK Provides Information About "FUJI" Award

Amateur Satellite "Fuji", SWL Amateur Satellite "Fuji" applicants are required to make contacts with 10 different amateur stations through the amateur radio satellite "Fuji" (only contacts in CW or SSB mode), and obtain the QSL cards from those stations. This award applies for both FO-12 (JAS-1) which was launched at 20:45 UTC in 12-AUG-1986 and JAS-1B which was launched on 07-FEB-1990. Any contact thru FO-12 or FO-20 is good for the "Fuji Award" application. A fee of 8 IRCs or US $4 will be charged per award. An additional 2 IRCs will be charged for air mail delivery regardless of the number of the awards claimed. If QSL cards are submitted, sufficient funds for return postage will also be required. All correspondences should be sent to:

Japan Amateur Radio League - Award Desk,
1-14-2 Sugamo, Toshima, Tokyo 170, Japan

[The AMSAT News Service would like to thank Kazu Sakamoto (JJ1WTK) for this bulletin item. JJ1WTK can be reached at his e-mail address of qga02014@niftyserve.or.jp]

/EX
SB SAT @ AMSAT $ANS-099.03
POSAT-1 VOICE CONTACTS

HR AMSAT NEWS SERVICE BULLETIN 099.03 FROM AMSAT HQ
SILVER SPRING, MD APRIL 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-099.03

CT1ERC Reports POSAT-1 Voice Contacts Made

CT1ERC reports that a special event amateur satellite station, CU2APO, was setup on the island of San Miguel in the AZORES for a technical exhibition to a youth grounp using POSAT-1. This demonstration was arranged by the PoSAT Consortium in which they agree to switch the satellite to operate on the amateur frequencies and it was configured as a FM transponder for a single pass to allow voice contacts between this island in the middle of the Atlantic ocean and the continent. Everything was arranged overnight and on short notice so unfotunately there was not enough time to send out notices of this event for other radio amateurs to participate. However, CT1ERC wishes to pass allong his report of the this first time voice contact on POSAT-1.

"The uplink frequency was 145.975 MHz and the downlink frequency was 435.275 MHz which by coincidence is a frequency with alot of strong QRM at CT1ERC's QTH. At 12:28 UTC 24-FEB-1994, with the satellite heading from North, the mutual window between CT1ERC's station (located in the extreme North of Portugal) and CU2APO (located in the extreme West, half way to N. America) opened and he exchanged a QSO with Pedro Carvalho (CT1DBS). The reports were both S59 but only for short periods, due to the strong bursts of QRM which made communication very difficult. One minute later there appeared Miguel Gomes (CT1EVH) operating the club station CS1APO located in Lisbon and Artur Gomes (CT1DIA) located in Faro (extreme South of Portugal). The QRM affected all stations except CT1DIA who have copy all of us during the whole pass with reports between S57 and S59. Sometimes during the pass two Spanish stations, apparently mobile, in a QSO on the VHF band were completly unaware that they were using a satellite uplink and reaching the downlink with S55 to S57."

CT1ERC wants to thank to the the Consortium for made the satellite available for 10 minutes and to Pedro, CT1DBS, for all his efforts and hours spent in convencing the POSAT Consortium to allow this demonstation to happen.

[The AMSAT News Service (ANS) would like to thank Jose Carlos (CT1ERC) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-099.04
AO-13 OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 099.04 FROM AMSAT HQ
SILVER SPRING, MD APRIL 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-099.04

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS

18-Apr-94 0100 B 188 W5IU WA5ZIB
23-Apr-94 1800 B 180 VE2LVC W9ODI
30-Apr-94 2130 B 176 W9ODI VE2LVC
09-May-94 0000 B 175 W5IU WA5ZIB
14-May-94 1700 B 167 WA5ZIB W5IU
21-May-94 2130 B 185 VE2LVC W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control

Stations show up, any participant is invited to act as the NCS.

Slow Scanners are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other SSTV skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-099.05
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 099.05 FROM AMSAT HQ
SILVER SPRING, MD APRIL 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-099.05

Weekly OSCAR Status Reports: 09-APR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
20-Apr-94 7:35 -to- 27-Apr-94 7:55 UTC
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

AO-27: DL6AAU reports that he has hear some "big" signals from AO-27 with a indoor groundplane antenna without preamp. He receives signals S56 to S59 from stations on Buffin Island, which for DL6AAU, is considered a DX contact. DL6AAU notes that AO-27 really better signal than its famous "cousin" AO-21. [DL6UAA]

AO-21: A new digital voice message started to transmit this week on AO-21 on the occasion of the AMSAT-OE meeting. The actual schedule is as follows:

RUDAK-II Schedule: (Downlink 145.987 MHz, Uplink 435.016 MHz)
min/10 Beacon Mode
0..6 FM Repeater
7 Digital Audio
8..9 AFSK TLM
The following is the message that is broadcasted on AO-21 during the packet

beacon downlink: "++ Hi, this is the RUDAK-II experiment on AMSAT OSCAR 21
++ On occasion of the first AMSAT-OE meeting we send greetings to HAM's &
all over the world. We wish you to have PEACEFUL contacts via amateur
radio!" Reports are welcome to:
HTL
Amateur Radio Group
Anichstr. 46
A-6020 Innsbruck
Austria

[LW2DTZ]

KO-23: Working well and has a new pair of images. [WH6I]

KO-25: Also working well. [WH6I]

IO-26: Working well on the secondary frequency as advertised. [WH6I]

AO-16: Working well. [WH6I]

LO-19: Also working well. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current
set of orbital elements are not generating the correct AOS/LOS times at
your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you
provide will be of value to all OSCAR enthusiasts.

/EX

509. STS-59 Orbital State Vectors Rev #19

Newsgroup: rec.radio.amateur.space
Date: 1994-04-10 23:46:21 UTC
From: astroman@netcom.com
Message-ID: <astromanCo2I19.3v9@netcom.com>
Source record: 27713
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94100.57055586805
04/10/1994 13:41:36.026 UTC
ECI X: -3937556.326925 ft
M50 Y: -21265094.628949 ft
Z: 893696.336028 ft
Xdot: 13919.98047 ft/s
Ydot: -1683.85425 ft/s
Zdot: 21317.14844 ft/s
ndot/2 (drag): 0.00852427365 rev/day^2
nddt/6: 0.00000E+00 rev/day^3
Bstar: 0.00000E+00 1/Earth Radii
Elset #: 5
Rev @ Epoch: 19.00766840912

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

510. APT-Satellites: Report APR 10, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 07:17:30 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-110494071632@129.26.163.251>
Source record: 27714
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, APR 10, 1994

NOAA-9: APT 137.62 ON again
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 3-5: APT 137.85 On

NOAA-9 is back again. The vis-images of the late morning
descending passes show better illumination than those from
late afternoon ascending NOAA-11 which slowly drifts into
darker evening. NOAA-9 approaches 10 years of useful life
in orbit.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

511. SAREX Keps 4/11/94 at 8:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 08:17:31 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.010.1994@ampr.org>
Source record: 27715
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.010
SAREX Keps Update 4/11 at 8:00 UTC

Greenbelt, MD, 4/11/94 at 8:00 UTC

The official SAREX element set for this morning will be GSFC-005. This element sent was generated by Ron Parise, WA4SIR, of the Goddard Space Flight Center. Gil Carman, WA5NOM, reports that the predictions using GSFC-005 are closer to the real-time Orbiter state vector than GSFC-007 or JSC-009.

STS-59
1 23042U 94020A 94 99.70643805 0.00018312 11043-4 10773-4 0 58
2 23042 56.9974 262.7245 0009489 267.3550 92.6453 16.20229092 67

Satellite: STS-59
Catalog number: 23042
Epoch time: 94099.70643805 (09 APR 94 16:57:16.25 UTC)
Element set: GSFC-005
Inclination: 56.9974 deg
RA of node: 262.7245 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009489 Keplerian Elements
Arg of perigee: 267.3550 deg
Mean anomaly: 92.6453 deg
Mean motion: 16.20229092 rev/day Semi-major Axis: 6597.0622 Km
Decay rate: 0.18E-03 rev/day*2 Apogee Alt: 224.93 Km
Epoch rev: 5 Perigee Alt: 212.41 Km

NOTE - This element set is based on NORAD element set # 005.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

512. ARLK014 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 13:20:12 UTC
From: owner-w1aw-list@netcom.com
Message-ID: <$arlk014.1994@ampr.org>
Source record: 27716
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK014
ARLK014 Keplerian data

ZCZC SK81
QST de W1AW
Keplerian Bulletin 14 ARLK014
From ARRL Headquarters
Newington, CT April 9, 1994
To all radio amateurs

SB KEP ARL ARLK014
ARLK014 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058 B 94093.93015575 -.00000105 10000-3 0 2736
2 14129 27.1781 334.0078 6020533 167.5108 219.1680 2.05877978 53285
RS-10/11
1 18129U 87054 A 94096.18122248 0.00000067 57349-4 0 8871
2 18129 82.9274 22.0643 0010248 220.6223 139.4177 13.72334834340034
UO-11
1 14781U 84021 B 94096.58268703 0.00000327 63285-4 0 6797
2 14781 97.7904 114.6531 0012422 134.3680 225.8545 14.69185628539790
RS-12/13
1 21089U 91007 A 94095.92841184 0.00000034 20820-4 0 6776
2 21089 82.9188 65.0333 0028619 312.8771 46.9979 13.74038159158721
AO-13
1 19216U 88051 B 94091.48205291 -.00000461 10000-4 0 8989
2 19216 57.8647 260.1651 7210810 338.2200 2.3008 2.09726624 12909
UO-14
1 20437U 90005 B 94094.18864115 0.00000063 41497-4 0 9784
2 20437 98.5904 179.9647 0011994 50.9587 309.2663 14.29834719219014
AO-16
1 20439U 90005 D 94097.74580217 0.00000060 40418-4 0 7797
2 20439 98.5999 184.6333 0012204 41.3499 318.8593 14.29890088219532
DO-17
1 20440U 90005 E 94097.77696937 0.00000086 50060-4 0 7780
2 20440 98.5998 184.9635 0012408 40.0785 320.1309 14.30029345219556
```

```
WO-18
1 20441U 90005 F 94094.25256090 0.00000049 35972-4 0 7798
2 20441 98.6007 181.4888 0013013 50.7174 309.5160 14.30003284219059
LO-19
1 20442U 90005 G 94098.22368723 0.00000052 36965-4 0 7783
2 20442 98.6013 185.6514 0013284 38.8862 321.3288 14.30099046219638
FO-20
1 20480U 90013 C 94097.96669648 -.00000006 52518-4 0 6741
2 20480 99.0290 263.0912 0541461 138.5003 225.8553 12.83224980195126
AO-21
1 21087U 91006 A 94096.76922921 0.00000093 82657-4 0 4516
2 21087 82.9460 195.5516 0033925 284.0542 75.6843 13.74537051159776
UO-22
1 21575U 91050 B 94096.62196308 0.00000104 49862-4 0 4800
2 21575 98.4392 172.5493 0008170 138.1574 222.0255 14.36905377142801
KO-23
1 22077U 92052 B 94097.95284885 -.00000037 10000-3 0 3756
2 22077 66.0823 67.0326 0012336 304.5695 55.4171 12.86285521 77755
KO-25
1 22830U 93061 H 94098.16232175 0.00000083 50860-4 0 2795
2 22830 98.5601 172.6843 0012451 25.4816 334.6987 14.28045473 27700
IO-26
1 22826U 93061 D 94094.70192756 0.00000052 38697-4 0 2752
2 22826 98.6593 171.2616 0010140 64.2606 295.9612 14.27719595 27201
AO-27
1 22825U 93061 C 94095.20620110 0.00000048 37491-4 0 2753
2 22825 98.6598 171.7361 0009638 62.0236 298.1903 14.27616610 27271
PoSat
1 22829U 93061 G 94098.23630497 0.00000067 44725-4 0 2694
2 22829 98.6552 174.7792 0011042 43.2925 316.9112 14.28016869 27715
STS-59
1 00059U 94099.70641906 .00221188 00000-0 11303-3 0 93
2 00059 57.0053 262.7355 0009259 269.9963 90.0094 16.19806752 57
Mir
1 16609U 86017 A 94096.79131291 0.00006403 88312-4 0 5584
2 16609 51.6471 184.1054 0015736 115.6169 244.6451 15.58521118464908

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
April 12, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

513. Eprom 27C512 with access time of 120 ns

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 13:32:59 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.101.0@UPEI.CA>
Source record: 27717

I was wondering if anyone knew of a Canadian or US distributer or supplier
for the following two items which are being considered for the Trakbox
hardware upgrade:

1. 27C512 Eprom (Dip package) with 120 nanosecond access time.
2. Dallas Semiconductor microprocessor DS80C320

Any suggestions as to names or numbers would be greatly appreciated.

73 de David Seeler,
VY2DCS
Internet: seeler@upei.ca

514. Re: Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 14:40:09 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <2obng9INN6a9@newsstand.cit.cornell.edu>
Source record: 27718

In article <Cnyq2s.80@ncifcrf.gov> Joe Mack, mack@ncifcrf.gov writes:
>Get the ARRL &/or RSGB antenna handbooks. THe calculations for a helix
are
>trivial. They are wideband and non-critical in dimensions, unlike a
yagi.
>

Yeah, that is a very nice feature of them. Mine kept falling over tripod
and all when I first put it up (hey, I'm an EE, not an ME :-) and all the
dings
and bends didn't seem to faze it.

As for the calculations - my suggestion would be to put the formulas into
a spreadsheet so you can diddle the values and see what you come up with.
That is what I did and it was very handy in finally converging on a
working
design.

> However people don;t build them at 2m very often - they are more
>often used at UHF . I don't really know why but here are some guesses
>
> A 2m helix is large and hard to support (rods out from the center
>pole to the helix are long).

That is one important reason - they get fairly unweildy. After my
success with my 420-450 helix, I looked into doing one for 2 but
gave it up because of the size.

I think the other big reason is it's not as efficient an antenna for
the boom length. My 14 turn helix is 10 foot long and has about 15
db of gain. You can get the same gain smaller and lighter in a yagi
arrangement - but they are much trickier to adjust and have much
smaller usable bandwidth.

>
> It isn't 50 ohms. Itsa bout 140ohms and there are tricks to make
>it 50ohms but these are narrow band (still wide band by ham band
standards)
>and a little tricky to get going.

Go with the radial feed method (instead of coming into the center to
feed, you
squish the last turn into half the space, fatten the conductor to about 5
times the regular size (I used copper flashing) and feed it off the
center where
the turn comes down to the ground plane. On mine it easily handles the

band from
420 to 450. I use the same antenna for Oscar, ATV, SSB and FM.

>
> Maybe you can make more money by selling a yagi than a helix.
>
> It would beinteresting to find out the real reason, but most people
>if they want a fair bit of gain at 2m and 432 and want circular
polarisation
>they use crossed beams 1/4lambda apart

I think that is mostly the size vs gain issues. Helix'es are simple,
cheap,
forgiving, fun and work well. But they aren't the smallest antenna on the
block.

73 de Kevin, WB2EMS
"Coffee, that elixir which makes life possible before noon. "

515. Re: Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 15:40:30 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Apr11.154030.25438@ke4zv.atl.ga.us>
Source record: 27719

In article <JAY.17.2DA57809@medicine.dmed.iupui.edu> JAY@medicine.dmed.iupui.edu (Jay Sissom) writes:
>I am new to satelite communications. (This is just a warning!)
>
>I would like to build a 2m & a 70cm beam for use with satelites. Does anyone
>know of an article in QST or some other plan for such antennas?
>From what I understand, a normal 2m or 70cm beam antenna would work, but a
>circular polorization would be much better. I have no idea how one would
>build a circular polorized antenna.

Circular polarized crossed yagis are fairly simple to build. There are a couple of ways to get circular polarization with them. The way KLM does it is to space one of the antennas 1/4-wave further up the boom than the other and then combine the two antennas with a simple matching harness (two 1/4-wave 75 ohm cables to a Tee fitting). Or you can take the Cushcraft path and mount the two antennas' elements at the same points on the boom and combine them as above, but with an additional 1/4-wave length of 50 ohm cable in one leg to get the required 90 degree phase shift.

There are other forms of circularly polarized antennas. A couple are the helix (both axial and quadrafilar) and the Lindenblad. You can also use disc or loop yagis with crossed dipole driven elements. These are more common at S band.

A nice simple antenna for S band can be constructed of all thread rod for the boom, fender washers for parasitic elements, and a bunch of jam nuts to hold everything in place. The crossed dipole driven elements can be made from a piece of printed circuit board (duroid) with the driven elements and their phasing and matching harnesses etched onto the board and held in place with nylon jam nuts. The whole thing will fit in a piece of PVC or fiberglass tubing for weatherproofing, or you can just cover the driven elements and reflector with pipe and let the rest hang out in the breeze after a cold galvanize spray. (You could use circuit board for all the elements, but that much duroid board gets expensive.)

(You can use a short bolt, a drill, and a file to size the OD of the parasitic element washers. Just put the washer on the bolt with jam nuts, chuck it in the drill, and file to size.)

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

516. Re: Oscar Antennas ??

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 15:42:50 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Apr11.154250.25536@ke4zv.atl.ga.us>
Source record: 27720

In article <T36Jkc2w165w@barf80.nshore.org> wb8k@barf80.nshore.org (Dennis jakubisin) writes:
>What the latest gossip concerning what good & what isn't on Oscar yagi's
>for mode B & J.. KLM, M sqrd etc. Any comments?? The old Cushcraft AOP 1
>pkg I have been using for a few years rally barks, especially in wet
>weather.

You noticed that too, huh? :-)

I use the KLM-22C and the 40CX for my station. Clean patterns, good
gain, and they hold up really well.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

517. * SpaceNews 11-Apr-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 16:05:43 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0411.1994@ampr.org>
Source record: 27721
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0411
* SpaceNews 11-Apr-94 *

BID: $SPC0411

=========
SpaceNews
=========

MONDAY APRIL 11, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* NEW AO-13 SCHEDULE *
======================
Magnetorquing from attitude 180/0 to 230/-5 commenced on Apr 04 [Fri] 1810 UTC, orbit 4446/224, and continued for 8 perigees. The new schedule commenced on orbit 4452 MA 145 Apr 07 [Thu] 1120 UTC.

*** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11

NEW ATTITUDE - Note: The mean attitude for the period 1994 Apr 07-Jul 11 will be ALON/ALAT 230/0. This is an Alon 10 degrees "better" than originally proposed. It is achieved at the expense of a 10 degree "worse" Sun angle, which will will now reach 40 degrees (77% illumination) May 30-Jul 11. During that period the Mode-B transponder *might* have to be OFF from MA 250-80 to conserve battery power.

Please don't rely on gossip and rumour! Continuous up to date information about AO-13 operations is always available on the beacons, 145.812 MHz or 2400.664 MHz in CW, RTTY and 400 bps PSK. These bulletins are also posted to Internet, ANS, Packet, PacSats etc, and many international newsletters. A 400 bps PSK decoder is available from G3RUH and several DSP products; display software P3C.EXE etc from many AMSAT groups.

The active command stations are listed below, and constructive feedback about operations is always welcome.

Peter DB2OS @ DB0FAU.#NDS.DEU.EU
James G3RUH @ GB7DDX.#22.GBR.EU
Graham VK5AGR @ VK5WI.#ADL.#SA.AUS.OC

The above may also be reached via Internet (callsign@amsat.org) and KO-23.
Please remember to state clearly a return address.

Notes prepared on behalf of, and in total cooperation with the above by:

James Miller G3RUH @ GB7DDX.#22.GBR.EU 1994 Apr 04 [Mon] 0600 UTC

* AMSAT NET VIA SATELLITE *
==========
Bruce Paige, KB5ZRV, is the AMSAT Area Coordinator in Houston, Texas. Bruce runs a local AMSAT net that meets on the 147.100 MHz repeater every Tuesday evening at 10:00 PM local Central Time. The net is rebroadcast over the Galaxy 3 satellite, Transponder 17 on a 5.8 MHz subcarrier.

This net is then received live and retransmitted by repeater operators in Toronto, Canada, Anchorage, Alaska (3 repeaters), New England States (6 repeaters), Ontario, CA, Lawton, OK, Indianapolis, IN, Fargo, ND. It has also been heard in Hawaii and other states.

The net has a telephone number for those that would like to ask questions of the net or check in. There are beginners segments that lasts 3-5 minutes, and explain how satellite novices can work various satellites, describes different types of station equipment necessary to work satellites, and other topics that beginners find useful in getting started in satellite operations. SAREX operating techniques have also been covered.

This net re-broadcast is free for the taking by those with TVRO ground stations. The people who run the net are having a great time and have found many people are listening in that do not have AMSAT nets in their local areas.

Any comments can be directed to Bruce via the Internet at kb5zrv@amsat.org.

* FO-20 SCHEDULE *
==========
The FO-20 command station announced that FO-20 will be placed in Mode JA (Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through 26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:
06-Apr-94 06:45 -to- 13-Apr-94 07:10 UTC
20-Apr-94 07:35 -to- 27-Apr-94 07:55 UTC
11-May-94 06:54 -to- 18-May-94 07:20 UTC

Digital mode:
Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* FUJI AWARD INFORMATION *
==========

Kazu Sakamoto, JJ1WTK, reports that a "Fuji" award is available to users of the FO-20 satellite. Applicants should have confirmed CW or SSB contacts with 10 different amateur stations through the FO-20 Amateur Satellite. A fee of 8 IRCs or US $4 will be charged per award. An additional 2 IRCs will be charged for air mail delivery regardless of the number of the awards claimed. If QSL cards are submitted, sufficient funds for return postage will also be required.

Correspondence should be sent to:
Japan Amateur Radio League -- Award Desk
1-14-2 Sugamo, Toshima, Tokyo 170, Japan

* SpaceNews BBS UPDATE *
==========

The SpaceNews packet radio BBS sponsored by Mario, KD6ILO, reported in last week's issue of SpaceNews has changed frequency. It can now be found operating on 145.050 MHz. The latest issue of SpaceNews, as well as other AMSAT and satellite-related news and information can be found on this BBS. The BBS is also linked to the UoSAT-OSCAR-22 satellite through the N7RSN SatGate also located in Tacoma, WA.

* THANKS! *
==========

Thanks to all those who sent messages of appreciation to SpaceNews, especially:

K2UVG VE3OZL W4AT ZR5JRS VE7AHX

* FEEDBACK/INPUT WELCOMED *
==========

Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com

Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

518. STS-59 Element Set (94101.619)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 16:30:36 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94101.619@alsys.com>
Source record: 27722
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 23042U 94020A 94101.61900344 +.00018288 11044-4 10712-4 0 120
2 23042 56.9946 253.5022 0010718 289.2110 70.7819 16.20252631 360

Satellite: STS-59
Catalog number: 23042
Epoch time: 94101.61900344 (11 APR 94 14:51:21.90 UTC)
Element set: GSFC-012
Inclination: 56.9946 deg
RA of node: 253.5022 deg Space Shuttle Flight STS-59
Eccentricity: 0.0010718 Keplerian Elements
Arg of perigee: 289.2110 deg
Mean anomaly: 70.7819 deg
Mean motion: 16.20252631 rev/day Semi-major Axis: 6596.9983 Km
Decay rate: 0.18E-03 rev/day*2 Apogee Alt: 225.68 Km
Epoch rev: 36 Perigee Alt: 211.54 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
```

519. Meteosat/APT Trans. Sked

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 19:10:40 UTC
From: n4nr@vulcan.com
Message-ID: <HsTmkc1w165w@vulcan.com>
Source record: 27723

I am looking for an up to date Meteosat 3 /APT Transmission schedule.
Would really appreciate a copy....Thanks!

--
Dennis T. Dease internet - n4nr@vulcan.com (or n4nr@amsat.org)
Pelham, Alabama, USA packet radio - n4nr@kd4cim.al.usa.na

520. Re: 2 Line ElSets

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 19:56:56 UTC
From: charlier@lsid.hp.com
Message-ID: <Co422x.7E5@hpcvsnz.cv.hp.com>
Source record: 27724

leeannmyk@aol.COM wrote:
: Hello, My name is Mike Johnson. I am looking for a source for
: USSPACECMD/NORAD type 2 line element sets for a varity of vehicles (primarily
: 16609).

: Any help in finding this (these) source(s) would be greatly appreciated.
: I can also be contacted at johnsonm@Rush.aps.rl.af.mil

No need to look any further. They are posted on a regular basis to
this very notes group, with titles like:

ORBS$098.2L.AMSAT

In fact here's the Mir data from a recent set:

Mir
1 16609U 86017 A 94090.25081547 0.00008348 11343-3 0 5496
2 16609 51.6462 216.9197 0015558 91.3363 268.9434 15.58441517493803

--
Charlie Panek KX7L Hewlett Packard Company
charlier@lsid.hp.com Lake Stevens Instrument Division
Everett, Washington

521. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 23:36:12 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766107372@afit.af.mil>
Source record: 27725

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94101.25000000 .00017734 11042-4 10466-4 0 118
2 23042 56.9964 255.2840 0011421 290.8126 76.0752 16.20196288 296
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

522. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-11 23:36:27 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766107387@afit.af.mil>
Source record: 27726
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94101.25000000 .00017734 11042-4 10466-4 0 118
2 23042 56.9964 255.2840 0011421 290.8126 76.0752 16.20196288 296
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

523. High Altitude Balloon Flight in Colorado

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 01:32:49 UTC
From: rickvg@cscns.com
Message-ID: <1fVgjSEHGA9X057yn@cscns.com>
Source record: 27727

FLIGHT PROFILE FOR EOSS 16

LAUNCH DATE : April 23,1994
LAUNCH SITE: Thunder Ridge Middle School
Picadilly and Smokey Hill Rd.
Aurora, Colorado, USA
LAUNCH SITE COORDINATES: 39.62305 deg North
104.73544 deg West
LAUNCH TIME : 9:00 a.m.
FLIGHT EXPERIMENT: Ozone detection at various levels of the atmosphere
EXPERIMENT CONDUCTED BY: Random High School, Longmont Colorado.
PROJECT INTEGRATOR: Andy Kellett/ N0SIS
SECONDARY EXPERIMENT: Testing of the APRS.
(Automatic Position Reporting System)

FREQUENCIES:

Shuttle I:
Telemetry 144.340 MHz
Beacon 147.555
ATV 426.250

HF Net:
7230khz Phone + or - QRM

Foxhunters:
CRA Repeaters 147.225 MHz

PURPOSE OF THE FLIGHT:
There are several experiments that are going to be run on the flight of
EOSS 16.

1. The primary experiment will be the detection of Ozone at various
altitudes above Colorado. This experiment will be conducted by Random
High School. The students are interested in the Ozone concentration and
may do a follow up flight to see if the levels have changed. They will be
graphing the results and presenting them to the school science fair.

2. The second experiment will be the use of APRS (Automatic Position Reporting
System). The controller will be sending down text strings that will
include latitude and longitude in them which should plot the position of
the payload on any APRS equipped packet station within the footprint of
the balloon as the payload travels the skies of Colorado. The typical
footprint extends to ALL neighboring states. So, if you are in southern
Wyoming, south western Nebraska, western Kansas, western Oklahoma,
northern Texas, parts of New Mexico and Arizona and Eastern Utah, look

into tracking the progress of EOSS-16 with APRS. Of interest, noting the difference between Loran-C, which is used on Shuttle I, and GPS, which is used on Shuttle II.

In the Denver Metro Area check on my BBS, N0VSA-1 and find out where to get the APRS program.

From the APRS documentation:

THE LATEST APRS is posted on 410-280-2503 BBS. After version 3.11 I will also always post a file similar to: 400to401.zip which will contain only the files that changed in the lastest release.

Anyone interested is welcome to come to the launch site and experince what a EOSS flight is like. We will have the ground station computer set up and also have TV monitors set up so you can see the flight from the perspective of the payload's onboard B&W tv camera. After the payload has been launched there will plenty of people around to answer any questions that you may have.

Hope to see you there!!
Brian
N0VSA@W0GVT#NECO.CO.NOAM
brian.thomas@filebank.com

forwarded for Brian by:

73 -- Rick

****
* Rick von Glahn Edge of Space Sciences, Inc. *
* rickvg@cscns.com - Internet (preferred) Promoting Science and Education *
* 74620,637 - Compuserve through Amateur Radio and *
* N0KKZ@W0GVT.#NECO.CO.USA - packet radio High Altitude Balloons *
****

524. Green Card Lottery- Final One?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 08:13:50 UTC
From: nike@indirect.com
Message-ID: <2odl7u$48o@herald.indirect.com>
Source record: 27728
Cross-posted to: rec.radio.amateur.space,za.ads.jobs

Green Card Lottery 1994 May Be The Last One!
THE DEADLINE HAS BEEN ANNOUNCED.

The Green Card Lottery is a completely legal program giving away a certain annual allotment of Green Cards to persons born in certain countries. The lottery program was scheduled to continue on a permanent basis. However, recently, Senator Alan J Simpson introduced a bill into the U. S. Congress which could end any future lotteries. THE 1994 LOTTERY IS SCHEDULED TO TAKE PLACE SOON, BUT IT MAY BE THE VERY LAST ONE.

PERSONS BORN IN MOST COUNTRIES QUALIFY, MANY FOR FIRST TIME.

The only countries NOT qualifying are: Mexico; India; P.R. China; Taiwan, Philippines, North Korea, Canada, United Kingdom (except Northern Ireland), Jamaica, Domican Republic, El Salvador and Vietnam.

Lottery registration will take place soon. 55,000 Green Cards will be given to those who register correctly. NO JOB IS REQUIRED.

THERE IS A STRICT JUNE DEADLINE. THE TIME TO START IS NOW!!

For FREE information via Email, send request to cslaw@indirect.com

--
****
Canter & Siegel, Immigration Attorneys
3333 E Camelback Road, Ste 250, Phoenix AZ 85018 USA
cslaw@indirect.com telephone (602)661-3911 Fax (602) 451-7617

525. SAREX QSO Opportunities

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 11:24:17 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.011.1994@ampr.org>
Source record: 27729
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.011
SAREX QSO Opportunities 4/12

Greenbelt, MD, 4/12/94 at 11:00 UTC

The Shuttle Amateur Radio Experiment (SAREX) school group contacts have been quite successful. At this point, all but one school is complete. The SAREX Working Group will have more details on the success of these schools in later bulletins.

These succesful contacts have opened two school backup passes which can now be used for general voice operations. The SAREX Working Group anticipates that the STS-59 crew will be on-the-air during Orbit 56, which covers the western United States, starting around 20:56 UTC on April 12. In addition, the Paltamo, Finland, backup pass will provide hams in the Northern European area the opportunity to work the shuttle. This opportunity is expected to start at 7:08 UTC on April 13 during orbit 63.

As a reminder, the following are the voice uplink and downlink frequencies for SAREX:

Voice Downlink: (Worldwide) 145.55 MHz
Voice Uplink: 144.91, 144.93, 144.95, 144.97, 144.99 MHz
Voice Uplink: (Europe only) 144.70, 144.75, 144.80 MHz

Also, the voice call signs are N5QWL and N5RAX

The SAREX Working Group wishes you the best of luck in your efforts to contact the astronauts on the space shuttle Endeavour.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

526. STS Contacts, How? What Freqs?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 12:54:05 UTC
From: brunelli_pc@delphi.com
Message-ID: <J05vqPV.brunelli_pc@delphi.com>
Source record: 27735

I monitor the Shuttle occasionally and am noew masterful
enough with stsplus to think that i can pull off a shuttle
contact

I has a QST article on making contacts and CANT Find it..

So, Any info on uplink, downliknk, and voice/packet
protocols would be greatly appreciated.

thanks,

N1QDQ
Peter

527. Re: Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 13:34:36 UTC
From: zlau@arrl.org
Message-ID: <1994Apr12.133436.5905@arrl.org>
Source record: 27730

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:

: A nice simple antenna for S band can be constructed of all thread rod
: for the boom, fender washers for parasitic elements, and a bunch of jam
: nuts to hold everything in place. The crossed dipole driven elements can
: be made from a piece of printed circuit board (duroid) with the driven
: elements and their phasing and matching harnesses etched onto the board
: and held in place with nylon jam nuts. The whole thing will fit in a piece
: of PVC or fiberglass tubing for weatherproofing, or you can just cover the
: driven elements and reflector with pipe and let the rest hang out in the
: breeze after a cold galvanize spray. (You could use circuit board for
: all the elements, but that much duroid board gets expensive.)

: (You can use a short bolt, a drill, and a file to size the OD of the
: parasitic element washers. Just put the washer on the bolt with jam
: nuts, chuck it in the drill, and file to size.)

So how big does the boom have to be for it to work well on Oscar 13?
A 15 turn helix on a 20 inch boom seems to work just fine with a good
PHEMT preamplifier (0.33 dB system NF). On a 10 degree pass I heard
the beacon from ARRL HQ parking lot through the roof of W1AW quite well.
I read up in Kraus on the dimensions to use. The boom length includes
the rear mounting bracket. The receive converter is a little too
light to balance the antenna.

When receiving, you don't want your phasing networks to be too lossy,
raising your system noise figure. True, you could just use a big
dish, but I don't think I could carry stick a 4 ft. dish in my
carry-on luggage and get away with it :-). At least on Domestic
flights, they will always let you carry on on 22 x 14 x 9 inch
bag.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

528. ARLS018 STS-59/SAREX update

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 14:28:32 UTC
From: owner-w1aw-list@netcom.com
Message-ID: <$arls018.1994@ampr.org>
Source record: 27731
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SPACE @ ARL $ARLS018
ARLS018 STS-59/SAREX update

ZCZC AS62
QST de W1AW
Space Bulletin 018 ARLS018
From ARRL Headquarters
Newington, CT April 11, 1994
To all radio amateurs

SB SPACE ARL ARLS018
ARLS018 STS-59/SAREX update

STS-59/SAREX Update

After the successful check pass on April 9, the SAREX Working Group has had several reports of packet radio operation and some general voice QSO operation during the Shuttle passes over the US. In addition, the St. Bernard High School in Playa Del Rey, CA had a very excellent school group pass on April 10 (Rev 19). Students asked the astronauts a total of seven questions.

The official SAREX element set for this morning, April 11, will be GSFC-005. This element sent was generated by Ron Parise, WA4SIR, of the Goddard Space Flight Center. Gil Carman, WA5NOM, reports that the predictions using GSFC-005 are closer to the real-time Orbiter state vector than GSFC-007 or JSC-009.

STS-59
1 23042U 94020A 94 99.70643805 0.00018312 11043-4 10773-4 0 58
2 23042 56.9974 262.7245 0009489 267.3550 92.6453 16.20229092 67

Satellite: STS-59
Catalog number: 23042
Epoch time: 94099.70643805 (09 APR 94 16:57:16.25 UTC)
Element set: GSFC-005
Inclination: 56.9974 deg
RA of node: 262.7245 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009489 Keplerian Elements
Arg of perigee: 267.3550 deg
Mean anomaly: 92.6453 deg
Mean motion: 16.20229092 rev/day Semi-major Axis: 6597.0622 Km
Decay rate: 0.18E-03 rev/day2 Apogee Alt: 224.93 Km
Epoch rev: 5 Perigee Alt: 212.41 Km

NOTE - This element set is based on NORAD element set 005.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Thanks to Frank H. Bauer, KA3HDO of the SAREX Working Group for the
preceding information.
NNNN
/EX

529. Re: Eprom 27C512 with access time of 120 ns

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 14:54:33 UTC
From: kohjin@marina.prug.or.jp
Message-ID: <Co5Iqy.7Is@marina.prug.or.jp>
Source record: 27732

In article <seeler.101.0@UPEI.CA> seeler@UPEI.CA (David Seeler) writes:
>I was wondering if anyone knew of a Canadian or US distributer or supplier
>for the following two items which are being considered for the Trakbox
>hardware upgrade:
>
>1. 27C512 Eprom (Dip package) with 120 nanosecond access time.
>2. Dallas Semiconductor microprocessor DS80C320
>
>Any suggestions as to names or numbers would be greatly appreciated.
>
>73 de David Seeler,
>VY2DCS
>Internet: seeler@upei.ca

DALLAS SEMICONDUCTOR
4401 South Beltwood Parkway
Dallas, Texas 75244-3292

FAX:+1 214 450 3715
Phone: 214 450 0448

80C320 $15 Payment with Card acceptable.

Sorry but don't know of Eprom source in CA & USA.

--
----/---- Kohjin Yamada, JR1EDE [kohjin@marina.prug.or.jp]
Q-----T------H 504-55 Shimo-Yamaguchi, Hayama, Miura, Kanagawa, Japan
------/|------- Phone:+81-468-75-6750 Fax/Modem/Voice:+81-468-76-1176

530. Rise-Set Times 4/12

Newsgroup: rec.radio.amateur.space
Date: 1994-04-12 14:54:53 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.012.1994@ampr.org>
Source record: 27733
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SAREX @ AMSAT $STS-59.012
STS-59 Eastern R/S Times 04/12

Below are the rise and set times for STS-59 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

New York City STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:56:15 10:00:03 10:03 71 A-E 65
13Apr94 11:29:25 11:32:24 11:34 7 A-W 66
13Apr94 16:08:53 16:12:11 16:14 9 D-E 69
13Apr94 17:40:28 17:44:20 17:47 40 D-W 70

14Apr94 09:37:46 09:41:34 09:44 85 A-W 81
14Apr94 11:11:04 11:13:58 11:16 6 A-W 82
14Apr94 15:50:22 15:53:44 15:56 10 D-E 85
14Apr94 17:22:01 17:25:51 17:29 33 D-W 86

15Apr94 09:19:16 09:23:04 09:26 75 A-W 97
15Apr94 10:52:43 10:55:30 10:57 6 A-W 98
15Apr94 15:31:49 15:35:15 15:38 11 D-E 101
15Apr94 17:03:32 17:07:20 17:10 28 D-W 102

Washington D.C. STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:55:33 09:59:20 10:02 60 A-E 65
13Apr94 11:28:46 11:31:39 11:34 6 A-W 66
13Apr94 16:09:14 16:11:55 16:14 5 D-E 69
```

13Apr94 17:40:22 17:44:17 17:47 76 D-E 70

14Apr94 09:37:04 09:40:51 09:44 76 A-E 81
14Apr94 11:10:27 11:13:13 11:15 5 A-W 82
14Apr94 15:50:41 15:53:29 15:55 5 D-E 85
14Apr94 17:21:54 17:25:48 17:29 84 D-W 86

15Apr94 09:18:33 09:22:21 09:25 84 A-W 97
15Apr94 10:52:06 10:54:45 10:56 5 A-W 98
15Apr94 15:32:06 15:35:01 15:37 6 D-E 101
15Apr94 17:03:24 17:07:17 17:10 69 D-W 102

Atlanta, GA STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:53:35 09:57:19 10:00 37 A-E 65
13Apr94 11:26:51 11:29:31 11:31 5 A-W 66
13Apr94 17:40:52 17:44:10 17:46 9 D-E 70
13Apr94 19:12:31 19:16:07 19:19 16 D-W 71

14Apr94 09:35:04 09:38:49 09:42 46 A-E 81
14Apr94 17:22:19 17:25:43 17:28 10 D-E 86
14Apr94 18:54:07 18:57:38 19:00 14 D-W 87

15Apr94 09:16:32 09:20:18 09:23 60 A-E 97
15Apr94 17:03:45 17:07:14 17:10 12 D-E 102
15Apr94 18:35:41 18:39:06 18:42 12 D-W 103

Miami, FL STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:52:43 09:56:17 09:59 19 A-W 65
13Apr94 19:14:37 19:18:18 19:21 21 D-W 71

14Apr94 09:34:19 09:37:50 09:40 16 A-W 81
14Apr94 17:25:04 17:27:51 17:30 5 D-E 86
14Apr94 18:56:12 18:59:49 19:02 18 D-W 87

15Apr94 07:44:52 07:47:36 07:49 6 A-E 96
15Apr94 09:15:55 09:19:20 09:22 14 A-W 97
15Apr94 17:06:24 17:09:22 17:11 6 D-E 102
15Apr94 18:37:46 18:41:17 18:44 15 D-W 103

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.013
STS-59 Central R/S Times 04/12

Below are the rise and set times for STS-59 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that

the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Chicago, IL STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:55:39 09:58:40 10:01 8 A-E 65
13Apr94 11:26:34 11:30:20 11:33 31 A-W 66
13Apr94 17:38:27 17:42:16 17:45 25 D-E 70
13Apr94 19:10:45 19:14:03 19:16 10 D-W 71

14Apr94 09:37:01 09:40:10 09:42 9 A-E 81
14Apr94 11:08:09 11:11:53 11:15 27 A-W 82
14Apr94 17:19:57 17:23:48 17:27 29 D-E 86
14Apr94 18:52:22 18:55:33 18:58 8 D-W 87

15Apr94 09:18:22 09:21:37 09:24 10 A-E 97
15Apr94 10:49:41 10:53:23 10:56 24 A-W 98
15Apr94 17:01:26 17:05:18 17:08 33 D-E 102
15Apr94 18:33:58 18:37:00 18:39 7 D-W 103

Huntsville, AL STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:53:39 09:57:15 10:00 21 A-E 65
13Apr94 11:26:12 11:29:18 11:31 8 A-W 66
13Apr94 17:40:25 17:43:38 17:46 8 D-E 70
13Apr94 19:11:57 19:15:39 19:18 20 D-W 71

14Apr94 09:35:06 09:38:46 09:41 25 A-E 81
14Apr94 11:07:53 11:10:52 11:13 7 A-W 82
14Apr94 17:21:52 17:25:11 17:28 9 D-E 86
14Apr94 18:53:31 18:57:09 19:00 17 D-W 87

15Apr94 09:16:32 09:20:14 09:23 30 A-E 97
15Apr94 10:49:33 10:52:23 10:54 6 A-W 98
15Apr94 17:03:17 17:06:42 17:09 11 D-E 102
15Apr94 18:35:05 18:38:38 18:41 15 D-W 103

Houston, TX STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 09:52:02 09:55:12 09:57 9 A-E 65
13Apr94 11:23:42 11:27:02 11:29 11 A-W 66
13Apr94 19:11:43 19:15:30 19:18 25 D-E 71

14Apr94 09:33:24 09:36:42 09:39 11 A-E 81
14Apr94 11:05:21 11:08:34 11:11 10 A-W 82
14Apr94 18:53:13 18:57:01 19:00 30 D-E 87

15Apr94 09:14:46 09:18:10 09:21 13 A-E 97
15Apr94 10:47:00 10:50:05 10:52 8 A-W 98
15Apr94 18:34:40 18:38:30 18:41 37 D-E 103

Denver, CO STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 11:24:03 11:27:40 11:30 20 A-E 66
13Apr94 12:56:15 12:59:40 13:02 12 A-W 67
13Apr94 19:08:22 19:12:13 19:15 33 D-E 71
13Apr94 20:41:02 20:43:54 20:46 6 D-W 72

14Apr94 11:05:30 11:09:10 11:12 23 A-E 82
14Apr94 12:37:53 12:41:13 12:44 11 A-W 83
14Apr94 18:49:52 18:53:45 18:57 39 D-E 87
14Apr94 20:22:43 20:25:23 20:27 5 D-W 88

15Apr94 10:46:56 10:50:38 10:53 27 A-E 98
15Apr94 12:19:29 12:22:45 12:25 10 A-W 99
15Apr94 18:31:21 18:35:15 18:38 47 D-E 103

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.014
STS-59 Western R/S Times 04/12

Below are the rise and set times for STS-59 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Seattle, WA STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 12:55:16 12:58:41 13:01 13 A-E 67
13Apr94 14:26:39 14:30:27 14:33 34 A-W 68
13Apr94 15:59:41 16:03:00 16:05 9 A-W 69
13Apr94 17:32:35 17:35:51 17:38 9 D-E 70
13Apr94 19:04:36 19:08:25 19:11 25 D-E 71
13Apr94 20:36:39 20:40:21 20:43 19 D-W 72

14Apr94 12:36:41 12:40:11 12:43 15 A-E 83
14Apr94 14:08:12 14:12:00 14:15 31 A-W 84
14Apr94 15:41:17 15:44:34 15:47 9 A-W 85
14Apr94 17:14:07 17:17:25 17:20 9 D-E 86
14Apr94 18:46:07 18:49:58 18:53 28 D-E 87
14Apr94 20:18:12 20:21:51 20:25 17 D-W 88

15Apr94 12:18:06 12:21:39 12:24 16 A-E 99
15Apr94 13:49:44 13:53:30 13:56 28 A-W 100
15Apr94 15:22:50 15:26:06 15:28 9 A-W 101
15Apr94 16:55:38 16:58:57 17:01 9 D-E 102
15Apr94 18:27:36 18:31:28 18:34 30 D-E 103
15Apr94 19:59:44 20:03:19 20:06 15 D-W 104

Albuquerque, NM STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 11:22:47 11:26:30 11:29 31 A-E 66
13Apr94 12:55:46 12:58:39 13:01 6 A-W 67
13Apr94 19:09:20 19:12:49 19:15 12 D-E 71
13Apr94 20:41:14 20:44:43 20:47 13 D-W 72

14Apr94 11:04:16 11:08:00 11:11 38 A-E 82
14Apr94 12:37:28 12:40:13 12:42 5 A-W 83
14Apr94 18:50:48 18:54:22 18:57 14 D-E 87
14Apr94 20:22:50 20:26:13 20:29 11 D-W 88

15Apr94 10:45:43 10:49:29 10:52 48 A-E 98
15Apr94 12:19:09 12:21:45 12:23 5 A-W 99
15Apr94 18:32:15 18:35:52 18:39 15 D-E 103
15Apr94 20:04:26 20:07:41 20:10 10 D-W 104

Los Angeles, CA STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 11:22:16 11:24:58 11:27 5 A-E 66
13Apr94 12:52:58 12:56:38 12:59 22 A-W 67
13Apr94 20:39:33 20:43:26 20:46 53 D-E 72

14Apr94 11:03:34 11:06:27 11:08 7 A-E 82
14Apr94 12:34:34 12:38:10 12:41 19 A-W 83
14Apr94 20:21:04 20:24:57 20:28 68 D-E 88

15Apr94 10:44:53 10:47:55 10:50 8 A-E 98
15Apr94 12:16:08 12:19:41 12:22 17 A-W 99
15Apr94 20:02:33 20:06:26 20:09 85 D-W 104

Honolulu, HI STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 14:16:46 14:20:31 14:23 83 A-W 68
13Apr94 23:40:51 23:44:28 23:47 17 D-E 74

14Apr94 13:58:18 14:02:02 14:05 62 A-W 84
14Apr94 23:22:18 23:26:00 23:29 21 D-E 90

15Apr94 13:39:49 13:43:31 13:46 46 A-W 100
15Apr94 23:03:44 23:07:29 23:10 26 D-E 106

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.015
STS-59 World R/S Times 04/12

Below are the rise and set times for STS-59 for selected worldwide cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

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D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

London, England STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 05:32:38 05:36:16 05:39 19 A-E 62
13Apr94 07:04:15 07:08:07 07:11 40 A-W 63
13Apr94 08:36:49 08:40:31 08:43 18 D-W 64
13Apr94 10:09:07 10:12:58 10:16 27 D-E 65
13Apr94 11:41:08 11:45:01 11:48 39 D-W 66

14Apr94 05:14:06 05:17:46 05:20 21 A-E 78
14Apr94 06:45:48 06:49:39 06:53 37 A-W 79
14Apr94 08:18:22 08:22:04 08:25 18 D-W 80
14Apr94 09:50:39 09:54:30 09:57 28 D-E 81

14Apr94 11:22:40 11:26:32 11:29 34 D-W 82

15Apr94 04:55:32 04:59:14 05:02 24 A-E 94
15Apr94 06:27:19 06:31:10 06:34 34 A-W 95
15Apr94 07:59:54 08:03:35 08:06 18 D-W 96
15Apr94 09:32:09 09:36:01 09:39 30 D-E 97
15Apr94 11:04:10 11:08:01 11:11 31 D-W 98

Paris, France STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 05:32:38 05:36:24 05:39 30 A-E 62
13Apr94 07:04:36 07:08:24 07:11 26 A-W 63
13Apr94 08:37:19 08:40:55 08:44 14 D-W 64
13Apr94 10:09:37 10:13:26 10:16 24 D-E 65
13Apr94 11:41:36 11:45:29 11:48 36 D-W 66

14Apr94 05:14:07 05:17:54 05:21 33 A-E 78
14Apr94 06:46:10 06:49:57 06:53 25 A-W 79
14Apr94 08:18:53 08:22:28 08:25 14 D-W 80
14Apr94 09:51:08 09:54:58 09:58 25 D-E 81
14Apr94 11:23:09 11:27:00 11:30 32 D-W 82

15Apr94 04:55:35 04:59:23 05:02 38 A-E 94
15Apr94 06:27:42 06:31:28 06:34 24 A-W 95
15Apr94 08:00:24 08:04:00 08:07 14 D-E 96
15Apr94 09:32:38 09:36:29 09:39 27 D-E 97
15Apr94 11:04:39 11:08:29 11:11 29 D-W 98

Tokyo, Japan STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 02:51:43 02:55:06 02:58 10 D-E 60
13Apr94 04:23:27 04:27:04 04:30 17 D-W 61
13Apr94 18:47:03 18:50:42 18:53 24 A-E 71
13Apr94 20:19:42 20:22:47 20:25 8 A-W 72

14Apr94 02:33:11 02:36:39 02:39 12 D-E 76
14Apr94 04:05:02 04:08:35 04:11 14 D-W 77
14Apr94 18:28:31 18:32:13 18:35 29 A-E 87
14Apr94 20:01:23 20:04:21 20:06 7 A-W 88

15Apr94 02:14:37 02:18:10 02:21 13 D-E 92
15Apr94 03:46:36 03:50:03 03:52 12 D-W 93
15Apr94 18:09:58 18:13:41 18:16 35 A-E 103
15Apr94 19:43:02 19:45:52 19:48 6 A-W 104

Sydney, Australia STS-59 Element Set GSFC-005

date rise tca set el geo orbit

13Apr94 06:11:32 06:15:12 06:18 29 D-E 62
13Apr94 07:44:35 07:47:20 07:49 5 D-W 63

13Apr94 13:58:44 14:01:51 14:04 8 A-E 67
13Apr94 15:30:16 15:33:50 15:36 18 A-W 68

14Apr94 05:53:01 05:56:42 05:59 36 D-E 78
14Apr94 07:26:18 07:28:54 07:30 5 D-W 79
14Apr94 13:40:10 13:43:24 13:46 9 A-E 83
14Apr94 15:11:51 15:15:20 15:18 15 A-W 84

15Apr94 05:34:28 05:38:11 05:41 46 D-E 94
15Apr94 13:21:36 13:24:55 13:27 10 A-E 99
15Apr94 14:53:26 14:56:49 14:59 13 A-W 100

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

531. STS-59 Orbital State Vectors Rev #57

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 00:10:45 UTC
From: astroman@netcom.com
Message-ID: <astromanCo68Hy.4CC@netcom.com>
Source record: 27734
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94102.92530216435
04/12/1994 22:12:26.106 UTC
ECI X: 6085338.798417 ft
M50 Y: -12845218.379862 ft
Z: 16302031.674325 ft
Xdot: 14693.08594 ft/s
Ydot: 18689.21484 ft/s
Zdot: 9239.76172 ft/s
ndot/2 (drag): 0.01295477563 rev/day^2
nddt/6: 0.00000E+00 rev/day^3
Bstar: 5.87760E-04 1/Earth Radii
Elset #: 12
Rev @ Epoch: 57.17838537400

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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532. SAREX Keps 4/13 at 5:40 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 06:13:53 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-059.016.1994@ampr.org>
Source record: 27736
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.016
SAREX Keps 4/13 at 5:40 UTC

Greenbelt, MD, 4/13/94 at 5:40 UTC

The official SAREX element set at this time is GSFC-014. This element set was generated by Ron Parise, WA4SIR, of the Goddard Space Flight Center. Gil Carman, WA5NOM, reports that the predictions using GSFC-014 were 13 seconds earlier than GSFC-005 as of 18:00 UTC on 4/12.

The SAREX Working group has had several inquiries regarding the use of "older" element sets during the STS-59 mission. Daily trim burns are planned during this flight to keep the ascending node crossing to within 0.1 degree of the planned preflight Keps. Thus, for periods of time, some of the "older" keps are closer to the current orbiter state vector than the somewhat "newer" Keps. If you run a comparison of the various orbital elements produced thus far, they are all within 10 to 20 seconds of one another. Gil Carman reports that this same trim burn approach was used during the STS-9 mission which also carried Owen Garriott, W5LFL.

STS-59
1 23042U 94020A 94102.60601196 0.00019765 11068-4 10664-4 0 148
2 23042 56.9943 248.7421 0009326 283.3969 76.6081 16.21184650 526

Satellite: STS-59
Catalog number: 23042
Epoch time: 94102.60601196 (12 APR 94 14:32:39.43 UTC)
Element set: GSFC-014
Inclination: 56.9943 deg
RA of node: 248.7421 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009326 Keplerian Elements
Arg of perigee: 283.3969 deg
Mean anomaly: 76.6081 deg
Mean motion: 16.21184650 rev/day Semi-major Axis: 6594.4697 Km
Decay rate: 0.20E-03 rev/day*2 Apogee Alt: 222.23 Km
Epoch rev: 52 Perigee Alt: 209.93 Km

NOTE - This element set is based on NORAD element set # 014.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

533. Working AO-21 with TH-78A

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 10:47:38 UTC
From: gosset@pbr322.ceingebi.unam.MX
Message-ID: <Pine.3.87.9404131038.C18692-0100000@pbr322>
Source record: 27740

Hello everyone,

I am interested in working AO-21 using the 435.015 uplink
frequency. However, I have a kenwood TH-78A and have not been able to
enter that frequency, the closest I can get is 435.0125. This is because
the freq. steps that can be selected on UHF are: 10, 12.5 20 or 25 kHz.
My questions are: can I work AO-21 on 435.0125?
How can I modify the TH-78A so it can transmit on 435.015?

Your answers to these questions and general comments about working
AO-21 will be greatly appreciated.
Hope to hear you on AO-21 soon!

73 & DX de XE1RGL Guillermo

534. Omni antennas for AO-16

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 12:56:46 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.4.000CF29C@teleport.com>
Source record: 27742

This fall, I will be sailing my 30 Catalina to Hawaii. I have HF and Maririme mobile, but I would like to be able to use AO-16 as well. I have been on the pacsats for 3 years, but I have always used steered directional antennas (the long KLMs). Since these would be quite impractical on my boat, I want to see if an omnidirectional set of antennas can be effective on AO-16. I would rather do it on KO-23, but there just wouldn't be enough gain...

I have used a turnstile type of antenna on 137 mHz weather sats, but that is the end of my experience with omnis and sats. Does anyone use this or any other with good success? I can get the Eggbeater type antennas too, but nobody locally has used one on Pacsats....

Anyway, it would really be fun to keep up on the sats during my trip, as I plan on staying the Winter in Hawaii, and I don't want to go through satellite withdrawals!!!

Thanks, Bill, n7ryw@teleport.com Portland, OR

535. STS-59 Orbital State Vectors Rev #66

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 13:26:39 UTC
From: astroman@netcom.com
Message-ID: <astromanCo79CF.5K2@netcom.com>
Source record: 27737
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94103.50139128472
04/13/1994 12:02:00.207 UTC
EFG E: 14706552.30 ft
F: 15678202.31 ft
G: -2514039.25 ft
Edot: -10753.0118 ft/s
Fdot: 6686.1936 ft/s
Gdot: -21190.4119 ft/s
ndot/2 (drag): 0.00129986000 rev/day^2
nddt/6: 0.00000E+00 rev/day^3
Bstar: 5.84169E-05 1/Earth Radii
Elset #: 14
Rev @ Epoch: 66.52213473838

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

536. Re: Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 14:20:59 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Apr13.142059.5398@ke4zv.atl.ga.us>
Source record: 27738

In article <1994Apr12.133436.5905@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
>Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
>: A nice simple antenna for S band can be constructed of all thread rod
>: for the boom, fender washers for parasitic elements, and a bunch of jam
>: nuts to hold everything in place. The crossed dipole driven elements can
>: be made from a piece of printed circuit board (duroid) with the driven
>: elements and their phasing and matching harnesses etched onto the board
>
>So how big does the boom have to be for it to work well on Oscar 13?
>A 15 turn helix on a 20 inch boom seems to work just fine with a good
>PHEMT preamplifier (0.33 dB system NF). On a 10 degree pass I heard
>the beacon from ARRL HQ parking lot through the roof of W1AW quite well.
>I read up in Kraus on the dimensions to use. The boom length includes
>the rear mounting bracket. The receive converter is a little too
>light to balance the antenna.

Nurad makes a commercial version of the antenna I described (for the
1.9 GHz band). They claim 19 dbc for it. It's about 4 feet long and 2
inches in diameter including the fiberglass housing and transmitter
mount. We use a tripod bag to hold it and a tripod. The stewardess
will stow it with carry on garment bags. We carry the transmitters
and receivers in a small Haliburton case that will stow in the overhead
compartments. We buy a ticket for our camcorders so they can ride up
front too. It doesn't pay to allow the baggage handlers to get their
hands on delicate electronics. The antenna is very rugged, however,
and can take a lot of abuse. The ones on our vehicles have survived
impacts with tree limbs at highway speed.

I don't know the gain of your helix, but I expect it's considerably
less than 19 dbc, so you should be able to use the rod and washer
antenna design for Oscar 13.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

537. STS-59 Element Set (94103.284)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 15:30:34 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94103.284@alsys.com>
Source record: 27739
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 23042U 94020A 94103.28423883 +.00019321 11073-4 10308-4 0 169
2 23042 56.9943 245.4685 0009256 288.8199 71.1887 16.21374060 631

Satellite: STS-59
Catalog number: 23042
Epoch time: 94103.28423883 (13 APR 94 06:49:18.24 UTC)
Element set: GSFC-016
Inclination: 56.9943 deg
RA of node: 245.4685 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009256 Keplerian Elements
Arg of perigee: 288.8199 deg
Mean anomaly: 71.1887 deg
Mean motion: 16.21374060 rev/day Semi-major Axis: 6593.9561 Km
Decay rate: 0.19E-03 rev/day*2 Apogee Alt: 221.67 Km
Epoch rev: 63 Perigee Alt: 209.46 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
```

538. NACEC-ARS Net Info.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 20:02:00 UTC
From: Nacec.Hq@datag.mmbbs.mn.org
Message-ID: <319_9404132004@mmbbs.mn.org>
Source record: 27741

All of you fellow hams seriously interested in helping handle emergency radio message traffic, have we got a challange for you. NACEC, The North American Center For Emergency Communications, is building a high speed traffic system called NACEC-ARS (Affiliate Radio System).

The purpose of this net is to handle emergency traffic throughout North America. The goal is to build a system to get traffic delivered in about 60 minutes or less from the time it is put on the network.

NACEC-ARS also helps provide initial communications support between NACEC's Emergency Communications Field Teams and NACEC's Main Communications Center, to be build on 216 acres in Western Minnesota.

Information & Training nets are held every Sunday and Thursday. All stations interested in getting more information on NACEC, NACEC-ARS or information on getting involved in helping others with your radio skills are invited to check in. If you wish information the NSC will take your name, calls and the type of information you have requested. Net information follows:

Sunday Information & Training Nets:
NACEC-ARS/A 19:00 UTC 3.860 Mhz LSB
NACEC-ARS/B 20:00 UTC 7.262 Mhz LSB
NACEC-ARS/C 21:00 UTC 14.347 Mhz USB

Thursday Information & Training Net:
NACEC-ARS/D 9 PM local MN time on the TCFMC repeater
146.76 (output)

** If you hear a net in progress designated as NACEC-ARS/E it is an Emergency Traffic Net that is handling real Emergency traffic. Please do not interupt or check into these nets unless requested by the NCS or you are an authorized NACEC-ARS member station.

Hope to see all of you serious traffic handlers and others wishing to help, from around the U.S. and Canada on the nets. We can use all the help and support we can find to handle traffic in emergency situations. A mountain is only one shovel of earth each for a million people. Get involved and prepaired to help move a mountain of messages for those in need.

Thanks
73
Ed Addy/KE0EG
President
NACEC

... NACEC is "The North American Center For Emergency Communications Inc."

539. Re: OSCAR MODE S

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 23:39:09 UTC
From: P11163@email.mot.com
Message-ID: <1994Apr13.233909.15740@schbbs.mot.com>
Source record: 27748

In article <Xy6Jkc1w165w@barf80.nshore.org>, wb8k@barf80.nshore.org (Dennis jakubisin) says:
>
>Anyone know of an inexpensive (less that the $300+ commercial converters)
>way to get on Mode S. How about converting some of the TVRO LNA/B's down
>in freq??

TVRO LNA's are a bit unstable for narrow band signal work. The two most popular approaches to getting on Mode S are the SSB electronics 2.4 GHz down-converter or the Down East Microwave (DEM) down-converter. I operate on Mode S using the DEM setup. I use a three foot Ku dish (Wineguard) , a DEM low noise preamp and the DEM down-converter. The preamp is needed due to the length of coax between the dish feed and the weather proof housing I use for the down-converter. The SSB reportedly is weather-proof and can be mount at the feed point of the antenna. The cost of the DEM gear is ~$140 for the preamp and ~200 for the down-converter, if my memory serves me. The SSB system is about $400, as I remember. Down East Microwave advertises in QST as does the US rep for SSB Electronics.

Good luck!

Ned Stearns
AA7A

540. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 23:49:43 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766280983@afit.af.mil>
Source record: 27743

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94102.91666667 .00020107 11072-4 10735-4 0 153
2 23042 56.9913 247.2430 0009128 285.6005 88.1805 16.21290025 563
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

541. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-13 23:49:58 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766280998@afit.af.mil>
Source record: 27745
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94102.91666667 .00020107 11072-4 10735-4 0 153
2 23042 56.9913 247.2430 0009128 285.6005 88.1805 16.21290025 563
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

542. SAREX Keps 4/14 at 0:40 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 00:52:52 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.017.1994@ampr.org>
Source record: 27744
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.017
SAREX Keps 4/14 at 0:40 UTC

Greenbelt, MD, 4/14/94 at 0:40 UTC

The official SAREX element set at this time is GSFC-016. This element set
was generated by Ron Parise, WA4SIR, of the Goddard Space Flight Center.
Gil Carman, WA5NOM, reports that the predictions using GSFC-016 were 6
seconds earlier than GSFC-014 as of 15:00 UTC on 4/13.

STS-59
1 23042U 94020A 94103.28423883 0.00019321 11073-4 10308-4 0 169
2 23042 56.9943 245.4685 0009256 288.8199 71.1887 16.21374060 631

Satellite: STS-59
Catalog number: 23042
Epoch time: 94103.28423883 (13 APR 94 06:49:18.24 UTC)
Element set: GSFC-016
Inclination: 56.9943 deg
RA of node: 245.4685 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009256 Keplerian Elements
Arg of perigee: 288.8199 deg
Mean anomaly: 71.1887 deg
Mean motion: 16.21374060 rev/day Semi-major Axis: 6593.9561 Km
Decay rate: 0.19E-03 rev/day*2 Apogee Alt: 221.67 Km
Epoch rev: 63 Perigee Alt: 209.46 Km

NOTE - This element set is based on NORAD element set # 016.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

543. ?sts-59 QSL info?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 14:16:06 UTC
From: djw@unlinfo.unl.edu
Message-ID: <2ojj76$qkv@crcnis1.unl.edu>
Source record: 27746

I finally managed to do it!! I contacted the sts-59 robot on
packet(W5RRR-1). Now.......... I have my QSO number: How do I
QSL the shuttle? It's probably covered in a FAQ or something so any
pointers and/or advice-info would be appreciated!!
TNX.......Dan -WA0JRD... djw@unlinfo.unl.edu

544. AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 15:58:55 UTC
From: ip@g8sjp.demon.co.uk
Message-ID: <766339135snz@g8sjp.demon.co.uk>
Source record: 27747

Hi folks.

Could someone please confirm the UPLINK frequency for AO-21. The best I have
been able to find out is '435-ish'

73
--
Iain Philipps

545. AMSAT HF PBBS

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 18:44:45 UTC
From: BJARTS@stthomas.EDU
Message-ID: <01HB5Z2L56GI936YB9@stthomas.edu>
Source record: 27749

SB PBBS@AMSAT $ARTS-094
AMSAT PBBS MOVE

The AMSAT PBBS will be changing frequency and modes starting April
15th at 1600 UTC. The AMSAT PBBS will be on a Mark freqeuncy of 14.079,
that's (14.181.1 AFSK LSB), using the mode Pactor with the callsign WT0N.
The new schedule will be as follows: Monday THRU Saturday from 1600 UTC
until 2300 UTC on a Mark freqeuncy of 14.079. From 2330 UTC until 0400 UTC
on a Mark freqeuncy of 7.073.5 that's (7.075.6 AFSK LSB), using the Mode
Pactor. These changes have been made to better serve AMSAT users with better
coverage and use of a mode that many of the users have expressed an interest
in. If anyone would like to use the Mode G-TOR, please let me know and I
can see about setting up a schedule for G-TOR users. Please send any
comments or suggestions to one of the following:
INTERNET: BJARTS@STTHOMAS.EDU
PACKET: WT0N@WB0GDB.#STP.MN.USA.NOAM
PACTOR: WT0N

The AMSAT PBBS will have updated Keps and AMSAT BULLETINS, along with
SpaceNews and other satellite related items.

73 AND THANKS FOR YOUR TIME AND INTEREST THE AMATEUR SATELLTIE PROGRAM
de BJ ARTS WT0N

/EX

546. AMSAT HF PBBS MOVE

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 18:46:12 UTC
From: BJARTS@stthomas.edu
Message-ID: <$arts-094.1994@ampr.org>
Source record: 27750
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.info

SB PBBS@AMSAT $ARTS-094
AMSAT PBBS MOVE

The AMSAT PBBS will be changing frequency and modes starting April
15th at 1600 UTC. The AMSAT PBBS will be on a Mark freqeuncy of 14.079,
that's (14.181.1 AFSK LSB), using the mode Pactor with the callsign WT0N.
The new schedule will be as follows: Monday THRU Saturday from 1600 UTC
until 2300 UTC on a Mark freqeuncy of 14.079. From 2330 UTC until 0400 UTC
on a Mark freqeuncy of 7.073.5 that's (7.075.6 AFSK LSB), using the Mode
Pactor. These changes have been made to better serve AMSAT users with better
coverage and use of a mode that many of the users have expressed an interest
in. If anyone would like to use the Mode G-TOR, please let me know and I
can see about setting up a schedule for G-TOR users. Please send any
comments or suggestions to one of the following:
INTERNET: BJARTS@STTHOMAS.EDU
PACKET: WT0N@WB0GDB.#STP.MN.USA.NOAM
PACTOR: WT0N

The AMSAT PBBS will have updated Keps and AMSAT BULLETINS, along with
SpaceNews and other satellite related items.

73 AND THANKS FOR YOUR TIME AND INTEREST THE AMATEUR SATELLTIE PROGRAM
de BJ ARTS WT0N

/EX

547. Re: Building Sat antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 20:20:47 UTC
From: zlau@arrl.org
Message-ID: <1994Apr14.202047.9474@arrl.org>
Source record: 27751

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
: In article <1994Apr12.133436.5905@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
: >
: >So how big does the boom have to be for it to work well on Oscar 13?
: >A 15 turn helix on a 20 inch boom seems to work just fine with a good
: >PHEMT preamplifier (0.33 dB system NF). On a 10 degree pass I heard
: >the beacon from ARRL HQ parking lot through the roof of W1AW quite well.
: >I read up in Kraus on the dimensions to use. The boom length includes
: >the rear mounting bracket. The receive converter is a little too
: >light to balance the antenna.

: Nurad makes a commercial version of the antenna I described (for the
: 1.9 GHz band). They claim 19 dbc for it. It's about 4 feet long and 2
: inches in diameter including the fiberglass housing and transmitter
: mount. We use a tripod bag to hold it and a tripod. The stewardess

: I don't know the gain of your helix, but I expect it's considerably
: less than 19 dbc, so you should be able to use the rod and washer
: antenna design for Oscar 13.

19 dBc on a 7.7 wavelength boom is quite good. By contrast, a
26 element K1FO yagi has only 18.8 dBi of gain on 432 MHz.
Unfortunately, I've not been able to find anything in the
literature on designing such antennas. I'm pretty sure that
segment oriented programs are useless for designing them--far
too many segments to model even a couple of parasitically
coupled disks (how much can you do with a few hundred segments?).

I'd conservatively estimate the helix gain to be 15 dBic, enough for
a gain to temperature ratio greater than 1. A helix tends to be down
a dB or two in gain from an optimized yagi, but I'm not sure that the
savings in boom length is worth making all those elements! (cut the
boom length from 20 to 17 inches) Maybe if the uplink antenna were
comparable in size (at a modest power level)....

An interesting question that comes up is the relative temperatures
of the two arrays. This is important because of the low preamplifier
noise temperature. My guess is that a helix would tend to have a
lower noise temperature. This may be enough to offset the lower
gain. An interesting exercise is to graph the receiver sensitivity
vs. noise figure at various sky noise temperatures.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

548. Re: STS-59 Orbital State Vectors Rev #57

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 21:15:46 UTC
From: P11163@email.mot.com
Message-ID: <1994Apr14.211546.28943@schbbs.mot.com>
Source record: 27752
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

In article <astromanCo68Hy.4CC@netcom.com>, astroman@netcom.com (SignalMan) says:
>
>Vector format = 1017
>Satellite Name: STS-59
>Catalog Number: 23042 94020A
>Epoch Date/Time: 94102.92530216435
> 04/12/1994 22:12:26.106 UTC
>ECI X: 6085338.798417 ft
>M50 Y: -12845218.379862 ft
> Z: 16302031.674325 ft
> Xdot: 14693.08594 ft/s
> Ydot: 18689.21484 ft/s
> Zdot: 9239.76172 ft/s
>ndot/2 (drag): 0.01295477563 rev/day^2
>nddt/6: 0.00000E+00 rev/day^3
>Bstar: 5.87760E-04 1/Earth Radii
>Elset #: 12
>Rev @ Epoch: 57.17838537400
>
>MSDOS/PC software is available for conversion of
>OSV to 2 Line Keplerian Elements via ftp to:
>oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
>and the SIMTEL archives.
>
>State Vectors courtesy Ken Ernandes N2WWD
>
>SM
>
I have tried to "get" the file /pub/msdos/hamradio/v219331.zip a couple times
from the oak.oakland.edu site and several other mirror sites. It doesn't
appear to be there. I can "get" any other file at that site just fine but I get an
error message back when I try to "get" it that indicates that the file v219331.zip
is not a file. What gives? I have been trying to find this program a couple of times
and have been unsuccessful.Why don't people who have that program just use
it on the vectors that they seem to be able to get an just upload the keplarian
elements? Seems like the right thing to do to me.

Ned Stearns
AA7A

549. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 22:57:47 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766364267@afit.af.mil>
Source record: 27753

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94103.59722222 .00020013 11074-4 10581-4 0 188
2 23042 56.9942 243.9545 0009289 284.3491 103.1913 16.21418183 675
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

550. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-14 22:58:03 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766364283@afit.af.mil>
Source record: 27754
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94103.59722222 .00020013 11074-4 10581-4 0 188
2 23042 56.9942 243.9545 0009289 284.3491 103.1913 16.21418183 675
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

551. SAREX element set 4/14/94 at 0:40 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 02:27:20 UTC
From: marcbg@netcom.com
Message-ID: <$STS59017.1994@ampr.org>
Source record: 27756
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

Greenbelt, MD, 4/14/94 at 0:40 UTC

The official SAREX element set at this time is GSFC-016. This element set
was generated by Ron Parise, WA4SIR, of the Goddard Space Flight Center.
Gil Carman, WA5NOM, reports that the predictions using GSFC-016 were 6
seconds earlier than GSFC-014 as of 15:00 UTC on 4/13.

STS-59
1 23042U 94020A 94103.28423883 0.00019321 11073-4 10308-4 0 169
2 23042 56.9943 245.4685 0009256 288.8199 71.1887 16.21374060 631

Satellite: STS-59
Catalog number: 23042
Epoch time: 94103.28423883 (13 APR 94 06:49:18.24 UTC)
Element set: GSFC-016
Inclination: 56.9943 deg
RA of node: 245.4685 deg Space Shuttle Flight STS-59
Eccentricity: 0.0009256 Keplerian Elements
Arg of perigee: 288.8199 deg
Mean anomaly: 71.1887 deg
Mean motion: 16.21374060 rev/day Semi-major Axis: 6593.9561 Km
Decay rate: 0.19E-03 rev/day*2 Apogee Alt: 221.67 Km
Epoch rev: 63 Perigee Alt: 209.46 Km

NOTE:
This element set is based on NORAD element set # 016.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
--
Marc Grant Voice Mail: 214-246-1150
home: marcbg@netcom.com work: marcbg@esy.com Amateur Radio N5MEI

552. STS-59 Orbital State Vectors Rev #89

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 02:40:39 UTC
From: astroman@netcom.com
Message-ID: <astromanCoA4rr.FwF@netcom.com>
Source record: 27755
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94104.89669105324
04/14/1994 21:31:14.106 UTC
ECI X: 2019155.471079 ft
M50 Y: -15215137.202542 ft
Z: 15222360.072138 ft
Xdot: 18017.01562 ft/s
Ydot: 13922.94141 ft/s
Zdot: 11514.48438 ft/s
ndot/2 (drag): 0.01482654578 rev/day^2
nddt/6: 0.00000E+00 rev/day^3
Bstar: 6.11363E-04 1/Earth Radii
Elset #: 19
Rev @ Epoch: 89.15892374393

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

553. ORBS$105.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 13:57:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-105.o.1994@ampr.org>
Source record: 27757
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-105.O
Orbital Elements 105.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX April 15, 1994
BID: $ORBS-105.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94093.93015575
Element set: 273
Inclination: 27.1781 deg
RA of node: 334.0078 deg
Eccentricity: 0.6020533
Arg of perigee: 167.5108 deg
Mean anomaly: 219.1680 deg
Mean motion: 2.05877978 rev/day
Decay rate: -1.05e-06 rev/day^2
Epoch rev: 8125
Checksum: 301

Satellite: UO-11
Catalog number: 14781
Epoch time: 94101.00958292
Element set: 680
Inclination: 97.7900 deg
RA of node: 118.8735 deg
Eccentricity: 0.0012594
Arg of perigee: 120.8281 deg
Mean anomaly: 239.4170 deg
Mean motion: 14.69188820 rev/day
Decay rate: 3.06e-06 rev/day^2
Epoch rev: 54044
Checksum: 304

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94104.20127577
Element set: 889
Inclination: 82.9269 deg
RA of node: 16.1383 deg
Eccentricity: 0.0010438
Arg of perigee: 196.2914 deg
```

Mean anomaly: 163.7905 deg
Mean motion: 13.72334612 rev/day
Decay rate: 1.6e-07 rev/day^2
Epoch rev: 34113
Checksum: 297

Satellite: AO-13
Catalog number: 19216
Epoch time: 94102.44882608
Element set: 901
Inclination: 57.8540 deg
RA of node: 258.2544 deg
Eccentricity: 0.7212470
Arg of perigee: 338.9704 deg
Mean anomaly: 2.1469 deg
Mean motion: 2.09726746 rev/day
Decay rate: -5.91e-06 rev/day^2
Epoch rev: 4463
Checksum: 313

Satellite: FO-20
Catalog number: 20480
Epoch time: 94097.96669648
Element set: 674
Inclination: 99.0290 deg
RA of node: 263.0912 deg
Eccentricity: 0.0541461
Arg of perigee: 138.5003 deg
Mean anomaly: 225.8553 deg
Mean motion: 12.83224980 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 19512
Checksum: 315

Satellite: AO-21
Catalog number: 21087
Epoch time: 94103.24778531
Element set: 453
Inclination: 82.9451 deg
RA of node: 190.7595 deg
Eccentricity: 0.0033903
Arg of perigee: 265.5771 deg
Mean anomaly: 94.1509 deg
Mean motion: 13.74537687 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 16066
Checksum: 324

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94100.29755183

Element set: 678
Inclination: 82.9191 deg
RA of node: 61.7921 deg
Eccentricity: 0.0028303
Arg of perigee: 300.4936 deg
Mean anomaly: 59.3425 deg
Mean motion: 13.74038743 rev/day
Decay rate: 6.3e-07 rev/day^2
Epoch rev: 15932
Checksum: 307

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94089.09349977
Element set: 248
Inclination: 1.5156 deg
RA of node: 104.5135 deg
Eccentricity: 0.2923641
Arg of perigee: 175.5080 deg
Mean anomaly: 188.1427 deg
Mean motion: 1.42202601 rev/day
Decay rate: -1.05e-06 rev/day^2
Epoch rev: 7
Checksum: 273

/EX

554. ORBS$105.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 13:58:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-105.d.1994@ampr.org>
Source record: 27758
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-105.D
Orbital Elements 105.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX April 15, 1994
BID: $ORBS-105.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94102.72595379
Element set: 980
Inclination: 98.5909 deg
RA of node: 188.3875 deg
Eccentricity: 0.0011861
Arg of perigee: 27.2725 deg
Mean anomaly: 332.9072 deg
Mean motion: 14.29836251 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22023
Checksum: 318

Satellite: AO-16
Catalog number: 20439
Epoch time: 94102.22422065
Element set: 780
Inclination: 98.5999 deg
RA of node: 189.0565 deg
Eccentricity: 0.0012191
Arg of perigee: 28.4313 deg
Mean anomaly: 331.7529 deg
Mean motion: 14.29890613 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 22017
Checksum: 301

Satellite: DO-17
Catalog number: 20440
Epoch time: 94102.18498366
Element set: 779
Inclination: 98.5997 deg
RA of node: 189.3180 deg
Eccentricity: 0.0012323
Arg of perigee: 28.1110 deg
```

Mean anomaly: 332.0736 deg
Mean motion: 14.30029880 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 22018
Checksum: 295

Satellite: WO-18
Catalog number: 20441
Epoch time: 94103.20868419
Element set: 781
Inclination: 98.6004 deg
RA of node: 190.3356 deg
Eccentricity: 0.0012767
Arg of perigee: 26.3552 deg
Mean anomaly: 333.8277 deg
Mean motion: 14.30004741 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 22033
Checksum: 278

Satellite: LO-19
Catalog number: 20442
Epoch time: 94102.77141414
Element set: 779
Inclination: 98.6011 deg
RA of node: 190.1446 deg
Eccentricity: 0.0013248
Arg of perigee: 26.1774 deg
Mean anomaly: 334.0074 deg
Mean motion: 14.30100099 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 22028
Checksum: 269

Satellite: UO-22
Catalog number: 21575
Epoch time: 94100.73038201
Element set: 481
Inclination: 98.4390 deg
RA of node: 176.5771 deg
Eccentricity: 0.0008365
Arg of perigee: 126.4458 deg
Mean anomaly: 233.7500 deg
Mean motion: 14.36905988 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 14339
Checksum: 313

Satellite: KO-23
Catalog number: 22077
Epoch time: 94101.99590421

Element set: 376
Inclination: 66.0840 deg
RA of node: 58.5659 deg
Eccentricity: 0.0012448
Arg of perigee: 304.1572 deg
Mean anomaly: 55.8265 deg
Mean motion: 12.86285353 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7827
Checksum: 316

Satellite: AO-27
Catalog number: 22825
Epoch time: 94103.75676341
Element set: 277
Inclination: 98.6585 deg
RA of node: 180.2028 deg
Eccentricity: 0.0009625
Arg of perigee: 39.3913 deg
Mean anomaly: 320.7961 deg
Mean motion: 14.27617999 rev/day
Decay rate: 3.9e-07 rev/day^2
Epoch rev: 2849
Checksum: 341

Satellite: IO-26
Catalog number: 22826
Epoch time: 94103.67236218
Element set: 277
Inclination: 98.6582 deg
RA of node: 180.1464 deg
Eccentricity: 0.0010144
Arg of perigee: 41.2739 deg
Mean anomaly: 318.9209 deg
Mean motion: 14.27721247 rev/day
Decay rate: 5.9e-07 rev/day^2
Epoch rev: 2848
Checksum: 310

Satellite: KO-25
Catalog number: 22830
Epoch time: 94098.16232175
Element set: 279
Inclination: 98.5601 deg
RA of node: 172.6843 deg
Eccentricity: 0.0012451
Arg of perigee: 25.4816 deg
Mean anomaly: 334.6987 deg
Mean motion: 14.28045473 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 2770

```
Checksum: 312

/EX
```

555. ORBS$105.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 14:00:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-105.w.1994@ampr.org>
Source record: 27759
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-105.W
Orbital Elements 105.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX April 15, 1994
BID: $ORBS-105.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94101.00139129
Element set: 779
Inclination: 99.0564 deg
RA of node: 150.6775 deg
Eccentricity: 0.0015918
Arg of perigee: 51.2366 deg
Mean anomaly: 309.0223 deg
Mean motion: 14.13606404 rev/day
Decay rate: 1.24e-06 rev/day^2
Epoch rev: 48085
Checksum: 292

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94100.95582658
Element set: 677
Inclination: 98.5107 deg
RA of node: 112.0090 deg
Eccentricity: 0.0013265
Arg of perigee: 160.6525 deg
Mean anomaly: 199.5160 deg
Mean motion: 14.24878608 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 39303
Checksum: 318

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94098.07651785
Element set: 277
Inclination: 82.5413 deg
RA of node: 324.3651 deg
Eccentricity: 0.0018014
Arg of perigee: 21.9974 deg
```

Mean anomaly: 338.1955 deg
Mean motion: 13.84713211 rev/day
Decay rate: 6.1e-07 rev/day^2
Epoch rev: 31265
Checksum: 307

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94098.19268769
Element set: 274
Inclination: 82.5434 deg
RA of node: 13.2140 deg
Eccentricity: 0.0018521
Arg of perigee: 77.8066 deg
Mean anomaly: 282.5130 deg
Mean motion: 13.16966002 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27404
Checksum: 295

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94100.87099016
Element set: 592
Inclination: 99.1690 deg
RA of node: 88.1470 deg
Eccentricity: 0.0011599
Arg of perigee: 328.2207 deg
Mean anomaly: 31.8263 deg
Mean motion: 14.12974927 rev/day
Decay rate: 8.7e-07 rev/day^2
Epoch rev: 28571
Checksum: 320

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94098.25903594
Element set: 276
Inclination: 82.5207 deg
RA of node: 199.6602 deg
Eccentricity: 0.0015886
Arg of perigee: 64.4555 deg
Mean anomaly: 295.8247 deg
Mean motion: 13.84361422 rev/day
Decay rate: 9.7e-07 rev/day^2
Epoch rev: 25801
Checksum: 345

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94101.19341955

Element set: 21
Inclination: 82.5524 deg
RA of node: 316.3095 deg
Eccentricity: 0.0007959
Arg of perigee: 97.8003 deg
Mean anomaly: 262.4018 deg
Mean motion: 13.04402304 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21416
Checksum: 258

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94101.51254177
Element set: 779
Inclination: 82.5415 deg
RA of node: 261.4205 deg
Eccentricity: 0.0015599
Arg of perigee: 339.9579 deg
Mean anomaly: 20.0965 deg
Mean motion: 13.84189194 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 19139
Checksum: 326

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94104.07071208
Element set: 941
Inclination: 98.8356 deg
RA of node: 126.2493 deg
Eccentricity: 0.0014259
Arg of perigee: 182.3327 deg
Mean anomaly: 177.7774 deg
Mean motion: 14.01313040 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 18472
Checksum: 294

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94102.71808719
Element set: 788
Inclination: 82.5271 deg
RA of node: 198.0617 deg
Eccentricity: 0.0011994
Arg of perigee: 228.2760 deg
Mean anomaly: 131.7372 deg
Mean motion: 13.83577706 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 17870

Checksum: 327

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94102.80901635
Element set: 686
Inclination: 82.5419 deg
RA of node: 215.8013 deg
Eccentricity: 0.0012757
Arg of perigee: 356.2642 deg
Mean anomaly: 3.8386 deg
Mean motion: 13.16460990 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14275
Checksum: 286

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94101.93065424
Element set: 2
Inclination: 98.6266 deg
RA of node: 131.1525 deg
Eccentricity: 0.0014259
Arg of perigee: 69.2654 deg
Mean anomaly: 290.9994 deg
Mean motion: 14.22390058 rev/day
Decay rate: 1.26e-06 rev/day^2
Epoch rev: 15111
Checksum: 279

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94101.19477854
Element set: 693
Inclination: 82.5577 deg
RA of node: 164.0582 deg
Eccentricity: 0.0014219
Arg of perigee: 10.5001 deg
Mean anomaly: 349.6414 deg
Mean motion: 13.16829596 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12764
Checksum: 307

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94102.45957491
Element set: 288
Inclination: 82.5453 deg
RA of node: 258.5140 deg
Eccentricity: 0.0023870

```
Arg of perigee: 51.1899 deg
Mean anomaly: 309.1378 deg
Mean motion: 13.83004021 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 3100
Checksum: 285

/EX
```

556. ORBS$105.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 14:01:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-105.m.1994@ampr.org>
Source record: 27760
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-105.M
Orbital Elements 105.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX April 15, 1994
BID: $ORBS-105.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94102.72059002
Element set: 270
Inclination: 98.6544 deg
RA of node: 179.2203 deg
Eccentricity: 0.0010938
Arg of perigee: 32.2906 deg
Mean anomaly: 327.8933 deg
Mean motion: 14.28017457 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 2835
Checksum: 282

Satellite: MIR
Catalog number: 16609
Epoch time: 94102.56201789
Element set: 565
Inclination: 51.6469 deg
RA of node: 155.1494 deg
Eccentricity: 0.0015833
Arg of perigee: 136.1913 deg
Mean anomaly: 224.0339 deg
Mean motion: 15.58607913 rev/day
Decay rate: 7.376e-05 rev/day^2
Epoch rev: 46578
Checksum: 325

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94102.19987320
Element set: 466
Inclination: 28.4706 deg
RA of node: 299.8372 deg
Eccentricity: 0.0006125
Arg of perigee: 118.9978 deg
```

Mean anomaly: 241.1215 deg
Mean motion: 14.90568077 rev/day
Decay rate: 7.49e-06 rev/day^2
Epoch rev: 1953
Checksum: 320

Satellite: GRO
Catalog number: 21225
Epoch time: 94101.88638886
Element set: 82
Inclination: 28.4612 deg
RA of node: 332.3008 deg
Eccentricity: 0.0003889
Arg of perigee: 188.8105 deg
Mean anomaly: 171.2384 deg
Mean motion: 15.40599014 rev/day
Decay rate: 3.264e-05 rev/day^2
Epoch rev: 4670
Checksum: 297

Satellite: UARS
Catalog number: 21701
Epoch time: 94103.91585104
Element set: 502
Inclination: 56.9831 deg
RA of node: 56.6147 deg
Eccentricity: 0.0004518
Arg of perigee: 102.1537 deg
Mean anomaly: 258.0001 deg
Mean motion: 14.96418936 rev/day
Decay rate: -1.749e-05 rev/day^2
Epoch rev: 14131
Checksum: 273

/EX

557. ORBS$105.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 14:03:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-105.n.1994@ampr.org>
Source record: 27861
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-105.N
2Line Orbital Elements 105.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX April 15, 1994
BID: $ORBS-105.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94093.93015575 -.00000105 00000-0 10000-3 0 2737
2 14129 27.1781 334.0078 6020533 167.5108 219.1680 2.05877978 81253
UO-11
1 14781U 84021B 94101.00958292 .00000306 00000-0 59703-4 0 6800
2 14781 97.7900 118.8735 0012594 120.8281 239.4170 14.69188820540441
RS-10/11
1 18129U 87054A 94104.20127577 .00000016 00000-0 14274-5 0 8892
2 18129 82.9269 16.1383 0010438 196.2914 163.7905 13.72334612341134
AO-13
1 19216U 88051B 94102.44882608 -.00000591 00000-0 10000-4 0 9011
2 19216 57.8540 258.2544 7212470 338.9704 2.1469 2.09726746 44639
FO-20
1 20480U 90013C 94097.96669648 -.00000006 00000-0 52518-4 0 6742
2 20480 99.0290 263.0912 0541461 138.5003 225.8553 12.83224980195126
AO-21
1 21087U 91006A 94103.24778531 .00000093 00000-0 82657-4 0 4537
2 21087 82.9451 190.7595 0033903 265.5771 94.1509 13.74537687160664
RS-12/13
1 21089U 91007A 94100.29755183 .00000063 00000-0 51693-4 0 6782
2 21089 82.9191 61.7921 0028303 300.4936 59.3425 13.74038743159327
ARSENE
1 22654U 93031B 94089.09349977 -.00000105 00000-0 00000 0 0 2486
2 22654 1.5156 104.5135 2923641 175.5080 188.1427 1.42202601 77
UO-14
1 20437U 90005B 94102.72595379 .00000044 00000-0 34216-4 0 9801
2 20437 98.5909 188.3875 0011861 27.2725 332.9072 14.29836251220236
AO-16
1 20439U 90005D 94102.22422065 .00000035 00000-0 30574-4 0 7800
```

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2 20439 98.5999 189.0565 0012191 28.4313 331.7529 14.29890613220173
DO-17
1 20440U 90005E 94102.18498366 .00000054 00000-0 37689-4 0 7797
2 20440 98.5997 189.3180 0012323 28.1110 332.0736 14.30029880220185
WO-18
1 20441U 90005F 94103.20868419 .00000027 00000-0 27434-4 0 7812
2 20441 98.6004 190.3356 0012767 26.3552 333.8277 14.30004741220330
LO-19
1 20442U 90005G 94102.77141414 .00000065 00000-0 42093-4 0 7790
2 20442 98.6011 190.1446 0013248 26.1774 334.0074 14.30100099220281
UO-22
1 21575U 91050B 94100.73038201 .00000069 00000-0 37734-4 0 4812
2 21575 98.4390 176.5771 0008365 126.4458 233.7500 14.36905988143394
KO-23
1 22077U 92052B 94101.99590421 -.00000037 00000-0 10000-3 0 3764
2 22077 66.0840 58.5659 0012448 304.1572 55.8265 12.86285353 78271
AO-27
1 22825U 93061C 94103.75676341 .00000039 00000-0 33835-4 0 2771
2 22825 98.6585 180.2028 0009625 39.3913 320.7961 14.27617999 28499
IO-26
1 22826U 93061D 94103.67236218 .00000059 00000-0 41781-4 0 2779
2 22826 98.6582 180.1464 0010144 41.2739 318.9209 14.27721247 28481
KO-25
1 22830U 93061H 94098.16232175 .00000083 00000-0 50860-4 0 2796
2 22830 98.5601 172.6843 0012451 25.4816 334.6987 14.28045473 27700
NOAA-9
1 15427U 84123A 94101.00139129 .00000124 00000-0 89802-4 0 7791
2 15427 99.0564 150.6775 0015918 51.2366 309.0223 14.13606404480855
NOAA-10
1 16969U 86073A 94100.95582658 .00000083 00000-0 53728-4 0 6770
2 16969 98.5107 112.0090 0013265 160.6525 199.5160 14.24878608393035
MET-2/17
1 18820U 88005A 94098.07651785 .00000061 00000-0 41351-4 0 2773
2 18820 82.5413 324.3651 0018014 21.9974 338.1955 13.84713211312656
MET-3/2
1 19336U 88064A 94098.19268769 .00000051 00000-0 10000-3 0 2742
2 19336 82.5434 13.2140 0018521 77.8066 282.5130 13.16966002274044
NOAA-11
1 19531U 88089A 94100.87099016 .00000087 00000-0 71741-4 0 5924
2 19531 99.1690 88.1470 0011599 328.2207 31.8263 14.12974927285714
MET-2/18
1 19851U 89018A 94098.25903594 .00000097 00000-0 73308-4 0 2766
2 19851 82.5207 199.6602 0015886 64.4555 295.8247 13.84361422258017
MET-3/3
1 20305U 89086A 94101.19341955 .00000044 00000-0 10000-3 0 211
2 20305 82.5524 316.3095 0007959 97.8003 262.4018 13.04402304214160
MET-2/19
1 20670U 90057A 94101.51254177 .00000024 00000-0 79036-5 0 7795
2 20670 82.5415 261.4205 0015599 339.9579 20.0965 13.84189194191399
FY-1/2
```

```
1 20788U 90081A 94104.07071208 .00000051 00000-0 61990-4 0 9418
2 20788 98.8356 126.2493 0014259 182.3327 177.7774 14.01313040184729
MET-2/20
1 20826U 90086A 94102.71808719 .00000075 00000-0 54357-4 0 7884
2 20826 82.5271 198.0617 0011994 228.2760 131.7372 13.83577706178702
MET-3/4
1 21232U 91030A 94102.80901635 .00000050 00000-0 10000-3 0 6863
2 21232 82.5419 215.8013 0012757 356.2642 3.8386 13.16460990142757
NOAA-12
1 21263U 91032A 94101.93065424 .00000126 00000-0 75726-4 0 22
2 21263 98.6266 131.1525 0014259 69.2654 290.9994 14.22390058151119
MET-3/5
1 21655U 91056A 94101.19477854 .00000051 00000-0 10000-3 0 6931
2 21655 82.5577 164.0582 0014219 10.5001 349.6414 13.16829596127646
MET-2/21
1 22782U 93055A 94102.45957491 .00000062 00000-0 43056-4 0 2884
2 22782 82.5453 258.5140 0023870 51.1899 309.1378 13.83004021 31005
POSAT
1 22829U 93061G 94102.72059002 .00000040 00000-0 33685-4 0 2708
2 22829 98.6544 179.2203 0010938 32.2906 327.8933 14.28017457 28350
MIR
1 16609U 86017A 94102.56201789 .00007376 00000-0 10038-3 0 5655
2 16609 51.6469 155.1494 0015833 136.1913 224.0339 15.58607913465786
HUBBLE
1 20580U 90037B 94102.19987320 .00000749 00000-0 59665-4 0 4663
2 20580 28.4706 299.8372 0006125 118.9978 241.1215 14.90568077 19532
GRO
1 21225U 91027B 94101.88638886 .00003264 00000-0 71596-4 0 821
2 21225 28.4612 332.3008 0003889 188.8105 171.2384 15.40599014 46706
UARS
1 21701U 91063B 94103.91585104 -.00001749 00000-0 -13204-3 0 5026
2 21701 56.9831 56.6147 0004518 102.1537 258.0001 14.96418936141318
/EX
```

558. STS-59 Element Set (94105.626)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 14:45:45 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94105.626@alsys.com>
Source record: 27870
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 23042U 94020A 94105.62622017 .00203357 11079-4 10947-3 0 213
2 23042 56.9933 234.1397 0007233 279.9940 80.0358 16.22652200 1014

Satellite: STS-59
Catalog number: 23042
Epoch time: 94105.62622017 = (15 APR 94 15:01:45.42 UTC)
Element set: 021
Inclination: 56.9933 deg
RA of node: 234.1397 deg Space Shuttle Flight STS-59
Eccentricity: .0007233 Keplerian Element set JSC-021
Arg of perigee: 279.9940 deg from NASA flight Day 7 vector
Mean anomaly: 80.0358 deg
Mean motion: 16.22652200 rev/day G. L. Carman
Decay rate: 2.03357e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 101

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
```

559. SAREX Keps 4/15/94 at 16:40 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 16:49:46 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.018.1994@ampr.org>
Source record: 27862
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SAREX @ AMSAT $STS-59.018
SAREX Keps 4/15 at 16:40 UTC

Greenbelt, MD, 4/15/94 at 16:40 UTC

The official SAREX element set for today is JSC-021. This element set
was generated by Gil Carman, WA5NOM, of the Johnson Space Flight Center.

STS-59
1 23042U 94020A 94105.62622017 .00203357 11079-4 10947-3 0 213
2 23042 56.9933 234.1397 0007233 279.9940 80.0358 16.22652200 1014

Satellite: STS-59
Catalog number: 23042
Epoch time: 94105.62622017 = (15 APR 94 15:01:45.42 UTC)
Element set: 021
Inclination: 56.9933 deg
RA of node: 234.1397 deg Space Shuttle Flight STS-59
Eccentricity: .0007233 Keplerian Element set JSC-021
Arg of perigee: 279.9940 deg from NASA flight Day 7 vector
Mean anomaly: 80.0358 deg
Mean motion: 16.22652200 rev/day G. L. Carman
Decay rate: 2.03357e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 101
Checksum: 271

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX
```

560. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 17:10:10 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-766429788@unomaha.edu>
Source record: 27863
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

```
Posted-By: auto-faq 3.2.1.2
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info,
and rec.radio.swap newsgroups. It is intended to serve as a guide for the new
reader on what to find where. Questions and comments may be directed to the
author, Jay Maynard, K5ZC, by Internet electronic mail at
jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September
1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to
note the rmgroup of rec.radio.amateur.packet, and to officially retire some
(in)famous threads of discussion on rec.radio.amateur.policy.

History
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Way back when, before there was a Usenet, the Internet hosted a mailing list
for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions
were held on the mailing list, and sent to the mailboxes of those who had
signed up for it. When the Usenet software was created, and net news as we
now know it was developed, a newsgroup was created for hams: net.ham-radio.
The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began
to dominate other topics in the group and on the list. This resulted in the
logical solution: a group was created to hold the packet discussion, and
another corresponding mailing list was created as well: net.ham-radio.packet
and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great
Renaming essentially unchanged, moving from net.ham-radio[.packet] to
rec.ham-radio[.packet]. Readership and volume grew with the rest of the
network.

The INFO-HAMS mailing list was originally run from a US Army computer at
White Sands Missile Range, SIMTEL20. There were few problems with this
arrangement, but one was that the system was not supposed to be used for
commercial purposes. Since one of hams' favorite pastimes is swapping
gear, it was natural for hams to post messages about equipment for sale
to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use
restriction, and after some argument, a group was created specifically
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for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
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Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

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Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

561. SAREX R/S Times 4/15

Newsgroup: rec.radio.amateur.space
Date: 1994-04-15 18:10:25 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.019.1994@ampr.org>
Source record: 27864
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.019
STS-59 Eastern R/S Times 04/15

Below are the rise and set times for STS-59 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

* Deorbit burn is scheduled to occur on orbit 165, with a landing at KSC
on orbit 166 at 15:53 UTC April 19. Data for subsequent orbits is provided
in the event of a landing delay.

New York City STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 08:57:05 09:00:51 09:04 72 A-W 113
16Apr94 10:30:29 10:33:14 10:35 5 A-W 114
16Apr94 15:09:22 15:12:47 15:15 11 D-E 117
16Apr94 16:41:00 16:44:47 16:48 27 D-W 118

17Apr94 08:37:36 08:41:22 08:44 61 A-W 129
17Apr94 10:11:06 10:13:46 10:15 5 A-W 130
17Apr94 14:49:51 14:53:18 14:56 12 D-E 133
17Apr94 16:21:32 16:25:16 16:28 24 D-W 134

18Apr94 08:18:05 08:21:50 08:25 52 A-W 145
18Apr94 14:30:17 14:33:47 14:36 12 D-E 149
18Apr94 16:02:01 16:05:43 16:08 21 D-W 150

19Apr94 07:58:31 08:02:16 08:05 45 A-W 161
19Apr94 09:32:15 09:34:44 09:36 4 A-W 162
19Apr94 12:40:01 12:41:24 12:42 1 D-E 164
19Apr94 14:10:41 14:14:14 14:17 13 D-E 165

* 19Apr94 15:42:29 15:46:09 15:49 19 D-W 166

Washington D.C. STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 08:56:23 09:00:08 09:03 82 A-W 113
16Apr94 10:29:52 10:32:29 10:34 5 A-W 114
16Apr94 15:09:39 15:12:33 15:14 6 D-E 117
16Apr94 16:40:52 16:44:44 16:48 67 D-W 118

17Apr94 08:36:53 08:40:38 08:43 70 A-W 129
17Apr94 14:50:06 14:53:05 14:55 6 D-E 133
17Apr94 16:21:22 16:25:14 16:28 56 D-W 134

18Apr94 08:17:21 08:21:06 08:24 59 A-W 145
18Apr94 14:30:31 14:33:34 14:36 7 D-E 149
18Apr94 16:01:51 16:05:42 16:09 47 D-W 150

19Apr94 07:57:48 08:01:32 08:04 50 A-W 161
19Apr94 14:10:54 14:14:02 14:16 7 D-E 165
* 19Apr94 15:42:18 15:46:07 15:49 40 D-W 166

Atlanta, GA STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 08:54:22 08:58:06 09:01 62 A-E 113
16Apr94 16:41:13 16:44:41 16:47 12 D-E 118
16Apr94 18:13:05 18:16:29 18:19 12 D-W 119

17Apr94 08:34:52 08:38:35 08:41 76 A-E 129
17Apr94 16:21:40 16:25:12 16:28 13 D-E 134
17Apr94 17:53:39 17:56:58 17:59 10 D-W 135

18Apr94 08:15:19 08:19:03 08:22 85 A-W 145
18Apr94 16:02:06 16:05:40 16:08 15 D-E 150
18Apr94 17:34:12 17:37:25 17:40 9 D-W 151

19Apr94 07:55:45 07:59:28 08:02 72 A-W 161
* 19Apr94 15:42:29 15:46:07 15:49 16 D-E 166
* 19Apr94 17:14:44 17:17:49 17:20 8 D-W 167

Miami, FL STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 07:22:47 07:25:28 07:27 6 A-E 112
16Apr94 08:53:45 08:57:08 09:00 13 A-W 113
16Apr94 16:43:54 16:46:49 16:49 6 D-E 118
16Apr94 18:15:10 18:18:40 18:21 14 D-W 119

17Apr94 07:03:06 07:05:57 07:08 7 A-E 128
17Apr94 08:34:21 08:37:38 08:40 11 A-W 129
17Apr94 16:24:17 16:27:20 16:29 7 D-E 134

17Apr94 17:55:44 17:59:09 18:02 12 D-W 135

18Apr94 06:43:25 06:46:24 06:48 8 A-E 144
18Apr94 08:14:55 08:18:07 08:20 10 A-W 145
18Apr94 16:04:39 16:07:49 16:10 8 D-E 150
18Apr94 17:36:17 17:39:36 17:42 11 D-W 151

19Apr94 06:23:42 06:26:48 06:29 9 A-E 160
19Apr94 07:55:28 07:58:34 08:01 9 A-W 161
* 19Apr94 15:44:59 15:48:15 15:51 9 D-E 166
* 19Apr94 17:16:48 17:20:01 17:22 9 D-W 167

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.020
STS-59 Central R/S Times 04/15

Below are the rise and set times for STS-59 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
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D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

* Deorbit burn is scheduled to occur on orbit 165, with a landing at KSC
on orbit 166 at 15:53 UTC April 19. Data for subsequent orbits is provided
in the event of a landing delay.

Chicago, IL STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 08:56:13 08:59:25 09:02 10 A-E 113
16Apr94 10:27:27 10:31:07 10:34 23 A-W 114
16Apr94 16:38:54 16:42:45 16:46 33 D-E 118
16Apr94 18:11:21 18:14:23 18:16 7 D-W 119

17Apr94 08:36:37 08:39:53 08:42 11 A-E 129
17Apr94 10:08:00 10:11:38 10:14 21 A-W 130
17Apr94 16:19:24 16:23:15 16:26 37 D-E 134
17Apr94 17:51:57 17:54:52 17:57 6 D-W 135

18Apr94 08:16:59 08:20:20 08:23 13 A-E 145
18Apr94 09:48:30 09:52:07 09:55 19 A-W 146
18Apr94 14:28:36 14:31:18 14:33 5 D-E 149
18Apr94 15:59:51 16:03:43 16:07 42 D-E 150
18Apr94 17:32:32 17:35:18 17:37 5 D-W 151

19Apr94 07:57:20 08:00:45 08:03 14 A-E 161
19Apr94 09:28:59 09:32:33 09:35 18 A-W 162
19Apr94 14:09:00 14:11:46 14:14 5 D-E 165
* 19Apr94 15:40:17 15:44:09 15:47 49 D-E 166
* 19Apr94 17:13:05 17:15:42 17:17 5 D-W 167

Huntsville, AL STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 08:54:22 08:58:02 09:01 31 A-E 113
16Apr94 10:27:19 10:30:07 10:32 6 A-W 114
16Apr94 16:40:46 16:44:09 16:47 11 D-E 118
16Apr94 18:12:29 18:16:01 18:19 14 D-W 119

17Apr94 08:34:50 08:38:31 08:41 36 A-E 129
17Apr94 10:07:58 10:10:39 10:12 5 A-W 130
17Apr94 16:21:13 16:24:40 16:27 12 D-E 134
17Apr94 17:53:02 17:56:30 17:59 13 D-W 135

18Apr94 08:15:16 08:18:58 08:22 43 A-E 145
18Apr94 09:48:35 09:51:09 09:53 5 A-W 146
18Apr94 16:01:38 16:05:09 16:08 13 D-E 150
18Apr94 17:33:34 17:36:56 17:39 11 D-W 151

19Apr94 07:55:41 07:59:23 08:02 52 A-E 161
* 19Apr94 15:42:01 15:45:35 15:48 14 D-E 166
* 19Apr94 17:14:04 17:17:21 17:20 10 D-W 167

Houston, TX STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 08:52:37 08:55:58 08:58 13 A-E 113
16Apr94 10:24:46 10:27:49 10:30 8 A-W 114
16Apr94 18:12:05 18:15:53 18:19 37 D-E 119

17Apr94 08:33:01 08:36:27 08:39 15 A-E 129
17Apr94 10:05:24 10:08:20 10:10 7 A-W 130
17Apr94 17:52:33 17:56:23 17:59 45 D-E 135

18Apr94 08:13:24 08:16:54 08:19 18 A-E 145
18Apr94 09:46:01 09:48:50 09:51 6 A-W 146
18Apr94 17:33:00 17:36:51 17:40 55 D-E 151

19Apr94 07:53:46 07:57:18 08:00 20 A-E 161
19Apr94 09:26:36 09:29:17 09:31 5 A-W 162
* 19Apr94 17:13:26 17:17:16 17:20 67 D-E 167

Denver, CO STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 10:24:42 10:28:22 10:31 28 A-E 114
16Apr94 11:57:11 12:00:25 12:03 9 A-W 115
16Apr94 18:08:46 18:12:38 18:16 47 D-E 119

17Apr94 10:05:10 10:08:51 10:12 32 A-E 130
17Apr94 11:37:46 11:40:56 11:43 9 A-W 131
17Apr94 17:49:15 17:53:08 17:56 56 D-E 135

18Apr94 09:45:36 09:49:18 09:52 37 A-E 146
18Apr94 11:18:20 11:21:26 11:24 8 A-W 147
18Apr94 17:29:43 17:33:35 17:36 65 D-E 151

19Apr94 09:26:00 09:29:43 09:32 43 A-E 162
19Apr94 10:58:52 11:01:53 11:04 7 A-W 163
* 19Apr94 15:38:59 15:41:44 15:43 5 D-E 166
* 19Apr94 17:10:09 17:14:01 17:17 77 D-E 167

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.021
STS-59 Western R/S Times 04/15

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E = passes east of observer
W = passes west of observer

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on orbit 166 at 15:53 UTC April 19. Data for subsequent orbits is provided
in the event of a landing delay.

Seattle, WA STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 11:55:48 11:59:18 12:02 16 A-E 115
16Apr94 13:27:22 13:31:06 13:34 27 A-W 116
16Apr94 15:00:24 15:03:37 15:06 9 A-W 117
16Apr94 16:33:08 16:36:24 16:39 9 D-E 118

16Apr94 18:05:01 18:08:51 18:12 30 D-E 119
16Apr94 19:37:05 19:40:39 19:43 15 D-W 120

17Apr94 11:36:15 11:39:47 11:42 18 A-E 131
17Apr94 13:07:54 13:11:37 13:14 25 A-W 132
17Apr94 14:40:57 14:44:09 14:46 9 A-W 133
17Apr94 16:13:39 16:16:56 16:19 9 D-E 134
17Apr94 17:45:31 17:49:22 17:52 33 D-E 135
17Apr94 19:17:37 19:21:07 19:24 13 D-W 136

18Apr94 11:16:39 11:20:14 11:23 20 A-E 147
18Apr94 12:48:24 12:52:06 12:55 24 A-W 148
18Apr94 14:21:28 14:24:39 14:27 8 A-W 149
18Apr94 15:54:07 15:57:26 16:00 9 D-E 150
18Apr94 17:25:59 17:29:50 17:33 36 D-E 151
18Apr94 18:58:07 19:01:34 19:04 12 D-W 152

19Apr94 10:57:02 11:00:39 11:03 21 A-E 163
19Apr94 12:28:52 12:32:33 12:35 22 A-W 164
19Apr94 14:01:57 14:05:07 14:07 8 D-W 165
* 19Apr94 15:34:34 15:37:53 15:40 10 D-E 166
* 19Apr94 17:06:24 17:10:16 17:13 39 D-E 167
* 19Apr94 18:38:36 18:41:59 18:44 11 D-W 168

Albuquerque, NM STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 10:23:30 10:27:12 10:30 50 A-E 114
16Apr94 18:09:39 18:13:16 18:16 15 D-E 119
16Apr94 19:41:45 19:45:00 19:47 9 D-W 120

17Apr94 10:03:58 10:07:42 10:10 60 A-E 130
17Apr94 17:50:07 17:53:46 17:56 17 D-E 135
17Apr94 19:22:20 19:25:29 19:28 8 D-W 136

18Apr94 09:44:26 09:48:09 09:51 73 A-E 146
18Apr94 17:30:33 17:34:15 17:37 19 D-E 151
18Apr94 19:02:54 19:05:56 19:08 7 D-W 152

19Apr94 09:24:51 09:28:35 09:31 85 A-W 162
* 19Apr94 17:10:57 17:14:41 17:17 21 D-E 167
* 19Apr94 18:43:27 18:46:20 18:48 6 D-W 168

Los Angeles, CA STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 10:22:40 10:25:39 10:28 8 A-E 114
16Apr94 11:53:50 11:57:21 12:00 16 A-W 115
16Apr94 19:39:54 19:43:46 19:47 85 D-W 120

17Apr94 10:03:02 10:06:07 10:08 9 A-E 130
17Apr94 11:34:24 11:37:51 11:40 14 A-W 131

17Apr94 19:20:24 19:24:15 19:27 75 D-W 136

18Apr94 09:43:22 09:46:34 09:49 10 A-E 146
18Apr94 11:14:57 11:18:20 11:21 13 A-W 147
18Apr94 19:00:52 19:04:43 19:08 62 D-W 152

19Apr94 09:23:42 09:26:59 09:29 12 A-E 162
19Apr94 10:55:28 10:58:47 11:01 12 A-W 163
* 19Apr94 18:41:18 18:45:09 18:48 51 D-W 168

Honolulu, HI STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 13:17:27 13:21:08 13:24 44 A-W 116
16Apr94 22:40:57 22:44:41 22:47 26 D-E 122

17Apr94 12:57:59 13:01:38 13:04 36 A-W 132
17Apr94 22:21:25 22:25:10 22:28 31 D-E 138

18Apr94 12:38:29 12:42:06 12:45 29 A-W 148
18Apr94 22:01:51 22:05:38 22:08 37 D-E 154

19Apr94 12:18:57 12:22:32 12:25 25 A-W 164
* 19Apr94 21:42:15 21:46:03 21:49 45 D-E 170

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX
SB SAREX @ AMSAT $STS-59.022
STS-59 World R/S Times 04/15

Below are the rise and set times for STS-59 for selected worldwide cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

* Deorbit burn is scheduled to occur on orbit 165, with a landing at KSC
on orbit 166 at 15:53 UTC April 19. Data for subsequent orbits is provided
in the event of a landing delay.

London, England STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 04:33:33 04:37:13 04:40 24 A-E 110
16Apr94 06:05:17 06:09:05 06:12 33 A-W 111
16Apr94 07:37:46 07:41:26 07:44 17 D-W 112
16Apr94 09:09:58 09:13:48 09:17 30 D-E 113
16Apr94 10:41:54 10:45:43 10:49 30 D-W 114

17Apr94 04:14:01 04:17:42 04:20 26 A-E 126
17Apr94 05:45:48 05:49:35 05:52 32 A-W 127
17Apr94 07:18:18 07:21:58 07:25 17 D-W 128
17Apr94 08:50:28 08:54:18 08:57 31 D-E 129
17Apr94 10:22:25 10:26:13 10:29 27 D-W 130

18Apr94 03:54:27 03:58:10 04:01 28 A-E 142
18Apr94 05:26:17 05:30:04 05:33 30 A-W 143
18Apr94 06:58:47 07:02:27 07:05 17 D-E 144
18Apr94 08:30:56 08:34:47 08:38 33 D-E 145
18Apr94 10:02:54 10:06:40 10:09 25 D-W 146

19Apr94 03:34:51 03:38:35 03:41 31 A-E 158
19Apr94 05:06:45 05:10:31 05:13 29 A-W 159
19Apr94 06:39:15 06:42:54 06:46 17 D-E 160
19Apr94 08:11:22 08:15:13 08:18 34 D-E 161
19Apr94 09:43:21 09:47:05 09:50 23 D-W 162

Paris, France STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 04:33:36 04:37:22 04:40 38 A-E 110
16Apr94 06:05:39 06:09:23 06:12 23 A-W 111
16Apr94 07:38:17 07:41:51 07:44 14 D-E 112
16Apr94 09:10:27 09:14:16 09:17 27 D-E 113
16Apr94 10:42:23 10:46:11 10:49 28 D-W 114

17Apr94 04:14:05 04:17:51 04:21 42 A-E 126
17Apr94 05:46:11 05:49:54 05:53 22 A-W 127
17Apr94 07:18:49 07:22:23 07:25 14 D-E 128
17Apr94 08:50:57 08:54:47 08:58 28 D-E 129
17Apr94 10:22:54 10:26:41 10:29 25 D-W 130

18Apr94 03:54:32 03:58:19 04:01 47 A-E 142
18Apr94 05:26:41 05:30:23 05:33 21 A-W 143
18Apr94 06:59:18 07:02:52 07:05 14 D-E 144
18Apr94 08:31:25 08:35:15 08:38 30 D-E 145
18Apr94 10:03:23 10:07:08 10:10 23 D-W 146

19Apr94 03:34:57 03:38:44 03:42 52 A-E 158
19Apr94 05:07:09 05:10:50 05:14 20 A-W 159
19Apr94 06:39:45 06:43:19 06:46 14 D-E 160
19Apr94 08:11:51 08:15:42 08:19 32 D-E 161
19Apr94 09:43:50 09:47:33 09:50 21 D-W 162

Tokyo, Japan STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 01:52:45 01:56:16 01:59 13 D-E 108
16Apr94 03:24:40 03:28:05 03:30 12 D-W 109
16Apr94 17:47:25 17:51:05 17:54 35 A-E 119
16Apr94 19:20:24 19:23:13 19:25 6 A-W 120

17Apr94 01:33:12 01:36:47 01:39 15 D-E 124
17Apr94 03:05:14 03:08:33 03:11 10 D-W 125
17Apr94 17:27:53 17:31:35 17:34 42 A-E 135
17Apr94 19:01:03 19:03:45 19:05 5 A-W 136

18Apr94 01:13:38 01:17:16 01:20 16 D-E 140
18Apr94 02:45:46 02:49:00 02:51 9 D-W 141
18Apr94 17:08:19 17:12:02 17:15 50 A-E 151
18Apr94 18:41:40 18:44:14 18:46 5 A-W 152

19Apr94 00:54:02 00:57:42 01:00 18 D-E 156
19Apr94 02:26:18 02:29:25 02:32 8 D-W 157
* 19Apr94 16:48:44 16:52:27 16:55 60 A-E 167

Sydney, Australia STS-59 Element Set GSFC-016

date rise tca set el geo orbit

16Apr94 05:12:26 05:16:08 05:19 48 D-E 110
16Apr94 12:59:15 13:02:33 13:05 10 A-E 115
16Apr94 14:31:01 14:34:22 14:37 12 A-W 116

17Apr94 04:52:54 04:56:38 04:59 59 D-E 126
17Apr94 12:39:42 12:43:04 12:45 12 A-E 131
17Apr94 14:11:35 14:14:51 14:17 11 A-W 132

18Apr94 04:33:21 04:37:05 04:40 72 D-E 142
18Apr94 12:20:07 12:23:33 12:26 13 A-E 147
18Apr94 13:52:08 13:55:18 13:57 9 A-W 148

19Apr94 04:13:47 04:17:31 04:20 85 D-W 158
19Apr94 12:00:31 12:03:59 12:06 14 A-E 163
19Apr94 13:32:39 13:35:43 13:38 8 A-W 164

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

562. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-16 01:04:11 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766458251@afit.af.mil>
Source record: 27865

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020 A 94104.64047025 .00000000 00000-0 00000+0 0 206
2 23042 056.9994 238.9091 0010483 284.1861 075.8894 16.22378726000840
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

563. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-16 01:04:27 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766458267@afit.af.mil>
Source record: 27866
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020 A 94104.64047025 .00000000 00000-0 00000+0 0 206
2 23042 056.9994 238.9091 0010483 284.1861 075.8894 16.22378726000840
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

564. Two-Line Orbital Element Sets (TLE377)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-16 01:07:00 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766458420@afit.af.mil>
Source record: 27867

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #377 -
Alouette 1
1 00424U 62049 94101.19711910 .00000061 00000-0 61120-4 0 9828
2 00424 80.4670 351.1034 0022425 289.7288 70.1436 13.67805450573244
ATS 3
1 03029U 67111A 94103.71496537 -.00000112 00000-0 10000-3 0 1776
2 03029 14.5970 8.1886 0009267 274.5769 70.9454 1.00272880 96784
Cosmos 398
1 04966U 71016 A 94104.37253494 .00155892 00000-0 30414-3 0 1341
2 04966 051.4518 218.4714 1083307 176.4147 184.5933 13.75346501763925
Starlette
1 07646U 75010A 94103.15291510 -.00000178 00000-0 -25827-4 0 7700
2 07646 49.8239 49.9870 0206189 121.5041 240.6124 13.82185234968859
LAGEOS
1 08820U 76039A 94102.49369089 .00000020 00000-0 10000-3 0 9825
2 08820 109.8254 113.1044 0044410 299.4088 60.2074 6.38664177162956
ETS-2
1 09852U 77014A 94096.70768241 .00000056 00000-0 10000-3 0 9609
2 09852 12.0278 42.3644 0002272 355.1437 113.0291 0.99996307 9941
GOES 2
1 10061U 77048A 94101.24615285 .00000073 00000-0 10000-3 0 3158
2 10061 11.0805 46.4925 0002531 11.3666 94.3466 1.00282516 6440
IUE
1 10637U 78012A 94100.54154404 -.00000208 00000-0 10000-3 0 9913
2 10637 34.5090 96.0251 1311583 33.8261 213.5012 1.00288579 12049
GPS BI-01
1 10684U 78020A 94094.52381870 -.00000028 00000-0 10000-3 0 2602
2 10684 64.6057 47.7019 0063139 163.8776 196.2760 1.98069611103474
GPS BI-02
1 10893U 78047A 94102.78629991 -.00000015 00000-0 10000-3 0 570
2 10893 63.6202 286.5208 0213997 13.5177 347.0677 2.01627359116757
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GOES 3
1 10953U 78062A 94098.32655219 .00000067 00000-0 10000-3 0 2893
2 10953 10.0084 49.3017 0002503 73.7788 17.2318 1.00261756 11021
SeaSat 1
1 10967U 78064A 94101.19605257 .00000037 00000-0 56843-4 0 2777
2 10967 108.0040 323.5939 0001394 263.2429 96.8553 14.37945000826732
GPS BI-03
1 11054U 78093A 94100.54890584 -.00000022 00000-0 10000-3 0 1716
2 11054 63.2754 283.7480 0043545 175.1509 184.8812 1.93505296113200
Nimbus 7
1 11080U 78098A 94097.23361456 .00000007 00000-0 45046-4 0 3816
2 11080 99.0607 343.4781 0009009 328.3464 31.7148 13.83734817780263
GPS BI-04
1 11141U 78112A 94096.30093190 -.00000042 00000-0 00000+0 0 8737
2 11141 64.6072 48.7574 0048322 24.4141 335.7888 1.92894743 2398
GPS BI-05
1 11690U 80011A 94103.09185685 -.00000032 00000-0 10000-3 0 7725
2 11690 64.9562 49.2529 0141832 198.0017 161.4836 2.00555186118233
GPS BI-06
1 11783U 80032A 94097.21962746 -.00000007 00000-0 10000-3 0 9609
2 11783 62.6935 280.6042 0209698 29.2704 331.8905 2.03456890102518
GOES 5
1 12472U 81049A 94088.26421226 .00000088 00000-0 10000-3 0 7585
2 12472 6.6572 58.9992 0005254 347.4041 94.7383 1.00290290 4961
Cosmos 1383
1 13301U 82066A 94097.23391824 .00000045 00000-0 36086-4 0 2798
2 13301 82.9332 1.7821 0026451 293.2652 66.5716 13.68053541587729
LandSat 4
1 13367U 82072A 94104.74926775 .00000051 00000-0 21446-4 0 4716
2 13367 98.1846 164.4134 0008211 90.4593 269.7536 14.57122633624827
IRAS
1 13777U 83004A 94104.05806844 -.00000129 00000-0 -58950-4 0 5848
2 13777 98.9759 296.3433 0012308 128.2575 231.9692 13.99205433242175
Cosmos 1447
1 13916U 83021A 94100.92317785 .00000054 00000-0 40679-4 0 3814
2 13916 82.9412 61.4422 0036407 215.5533 144.3190 13.74307495554099
TDRS 1
1 13969U 83026B 94103.80883919 -.00000194 00000-0 10000-4 0 2915
2 13969 7.5811 51.7917 0003744 68.5794 97.8928 1.00274706 13407
GOES 6
1 14050U 83041A 94101.21319817 -.00000116 00000-0 10000-3 0 1897
2 14050 5.4723 61.8476 0004688 325.6669 147.4318 1.00217529 12118
OSCAR 10
1 14129U 83058B 94093.93015575 -.00000105 00000-0 10000-3 0 2737
2 14129 27.1781 334.0078 6020533 167.5108 219.1680 2.05877978 53285
LandSat 5
1 14780U 84021A 94103.13923432 .00000101 00000-0 32394-4 0 492
2 14780 98.1705 164.1773 0005672 97.8101 262.3742 14.57134758538004
UoSat 2
1 14781U 84021B 94101.00958292 .00000306 00000-0 59703-4 0 6800
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2 14781 97.7900 118.8735 0012594 120.8281 239.4170 14.69188820540441
GPS BI-09
1 15039U 84059A 94100.92294998 -.00000059 00000-0 10000-3 0 1867
2 15039 63.9250 43.1607 0056611 219.3363 140.2301 2.00559340 71997
Cosmos 1574
1 15055U 84062A 94100.54710404 .00000044 00000-0 30939-4 0 5807
2 15055 82.9519 114.9388 0029382 46.1860 314.1718 13.73603712491344
GPS BI-10
1 15271U 84097A 94102.33723220 -.00000018 00000-0 10000-3 0 7860
2 15271 62.3886 280.4535 0144297 348.6185 11.0444 2.00578857 69135
Cosmos 1602
1 15331U 84105A 94102.11146250 .00000460 00000-0 51642-4 0 2723
2 15331 82.5356 139.6009 0022295 63.5363 296.8113 14.84367659514719
NOAA 9
1 15427U 84123A 94101.00139129 .00000124 00000-0 89802-4 0 7791
2 15427 99.0564 150.6775 0015918 51.2366 309.0223 14.13606404480855
GPS BI-11
1 16129U 85093A 94105.19791667 -.00000022 00000-0 10000-3 0 5826
2 16129 64.7044 45.1922 0140135 148.8942 294.6332 1.93432400 8888
Mir
1 16609U 86017A 94104.80609580 .00006708 00000-0 91817-4 0 5669
2 16609 51.6466 143.8890 0015448 142.9508 217.2549 15.58638827466139
SPOT 1
1 16613U 86019A 94102.33131166 .00000089 00000-0 62356-4 0 6654
2 16613 98.6946 177.1303 0001111 46.8561 313.2708 14.20054343107218
Cosmos 1766
1 16881U 86055A 94100.77341145 .00000485 00000-0 55976-4 0 1887
2 16881 82.5193 198.8711 0021156 88.1235 272.2403 14.83401370415462
EGP
1 16908U 86061A 94100.85525878 -.00000097 00000-0 00000+0 0 8778
2 16908 50.0067 291.4051 0011571 141.1810 218.9858 12.44409249 17005
NOAA 10
1 16969U 86073A 94100.95582658 .00000083 00000-0 53728-4 0 6770
2 16969 98.5107 112.0090 0013265 160.6525 199.5160 14.24878608393035
MOS-1
1 17527U 87018A 94104.21740615 .00000091 00000-0 99794-4 0 599
2 17527 99.0389 174.2368 0001394 64.4179 295.7126 13.94902932364020
GOES 7
1 17561U 87022A 94100.24957521 -.00000053 00000-0 10000-3 0 8068
2 17561 1.4067 76.6613 0004456 324.6040 134.4467 1.00273736 9295
Kvant-1
1 17845U 87030A 94103.97257665 .00013670 00000-0 18011-3 0 8144
2 17845 51.6449 148.0765 0015154 139.9353 220.2171 15.58632674466105
DMSP B5D2-3
1 18123U 87053A 94100.92326275 -.00000024 00000-0 10000-4 0 4221
2 18123 98.7885 293.6168 0014835 16.4010 343.7551 14.15347336351497
RS-10/11
1 18129U 87054A 94104.20127577 .00000016 00000-0 14274-5 0 8892
2 18129 82.9269 16.1383 0010438 196.2914 163.7905 13.72334612341134
Meteor 2-16
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1 18312U 87068A 94101.93722366 .00000072 00000-0 51899-4 0 2782
2 18312 82.5513 264.3950 0011549 304.6968 55.3105 13.84027378335896
Meteor 2-17
1 18820U 88005A 94102.55649538 .00000049 00000-0 30443-4 0 2782
2 18820 82.5413 320.8019 0017629 9.8679 350.2835 13.84713331313277
DMSP B5D2-4
1 18822U 88006A 94100.83994662 .00000062 00000-0 45940-4 0 5253
2 18822 98.4498 318.5696 0006037 172.2025 187.9248 14.22941962320945
Glonass 34
1 19163U 88043A 94100.37734679 .00000065 00000-0 10000-3 0 8795
2 19163 65.0146 112.7216 0007599 168.3205 191.7506 2.13102439 45215
Glonass 36
1 19165U 88043C 94100.90241765 .00000062 00000-0 10000-3 0 2741
2 19165 64.9993 112.6748 0004608 324.7418 35.2736 2.13102347 45840
METEOSAT 3
1 19215U 88051A 94104.09570898 -.00000253 00000-0 10000-3 0 8897
2 19215 1.5944 73.1408 0000448 345.6997 101.9674 1.00290994 9275
AO-13
1 19216U 88051B 94102.44882608 -.00000591 00000-0 10000-4 0 9011
2 19216 57.8540 258.2544 7212470 338.9704 2.1469 2.09726746 13130
OKEAN 1
1 19274U 88056A 94104.00188931 .00000242 00000-0 27375-4 0 8892
2 19274 82.5102 295.7102 0018214 218.8638 141.1255 14.82147607311577
Meteor 3-2
1 19336U 88064A 94102.21920772 .00000051 00000-0 10000-3 0 2751
2 19336 82.5446 10.3669 0018568 67.8724 292.4366 13.16966441274578
Glonass 39
1 19503U 88085C 94104.68207466 -.00000050 00000-0 10000-3 0 1716
2 19503 65.7551 351.4575 0005891 182.1180 177.9331 2.13102138 43417
NOAA 11
1 19531U 88089A 94100.87099016 .00000087 00000-0 71741-4 0 5924
2 19531 99.1690 88.1470 0011599 328.2207 31.8263 14.12974927285714
TDRS 2
1 19548U 88091B 94100.31711843 -.00000292 00000-0 10000-3 0 9016
2 19548 0.8673 77.8306 0002249 281.3189 251.3569 1.00266737 7520
Glonass 40
1 19749U 89001A 94103.31377887 .00000054 00000-0 10000-3 0 3828
2 19749 64.9581 112.1996 0007316 264.1195 95.8338 2.13101383 40898
Glonass 41
1 19750U 89001B 94104.30885565 .00000057 00000-0 10000-3 0 2740
2 19750 64.9829 112.2186 0008127 253.3095 106.6185 2.13101674 40936
GPS BII-01
1 19802U 89013A 94104.40462503 .00000041 00000-0 10000-3 0 8902
2 19802 55.0917 142.2461 0032878 180.5050 179.5680 2.00578787 37770
Akebono
1 19822U 89016A 94104.40630855 .00010558 00000-0 51540-3 0 2401
2 19822 75.0938 218.5022 3829948 337.6166 9.3982 7.77220852104333
Meteor 2-18
1 19851U 89018A 94102.30649747 .00000068 00000-0 47611-4 0 2772
2 19851 82.5216 196.4355 0015744 54.8621 305.4007 13.84361733258575
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MOP-1
1 19876U 89020B 94103.33510288 -.00000075 00000-0 00000+0 0 170
2 19876 0.3217 56.8116 0000908 335.6201 280.9126 1.00273843 6417
TDRS 3
1 19883U 89021B 94100.07574074 -.00000275 00000-0 00000+0 0 9003
2 19883 0.0111 160.2715 0001304 75.6711 308.3880 1.00270127 88782
GPS BII-02
1 20061U 89044A 94100.76304929 -.00000063 00000-0 10000-3 0 9093
2 20061 54.6866 319.1956 0127373 207.1181 152.2489 2.00565285 35443
Nadezhda 1
1 20103U 89050A 94100.71404049 .00000040 00000-0 25666-4 0 9804
2 20103 82.9608 337.5239 0038528 115.7342 244.7792 13.73836049239049
GPS BII-03
1 20185U 89064A 94104.09139789 .00000041 00000-0 10000-3 0 8973
2 20185 54.9621 142.8630 0010425 263.7880 96.1619 2.00574731 34081
GMS 4
1 20217U 89070A 94100.32519240 -.00000291 00000-0 10000-3 0 17
2 20217 0.0671 337.0119 0007965 151.5413 327.0158 1.00268326 17416
GPS BII-04
1 20302U 89085A 94103.12630469 -.00000025 00000-0 10000-3 0 9087
2 20302 53.6083 259.4328 0002085 287.5031 72.4260 2.00563574 32860
Meteor 3-3
1 20305U 89086A 94103.87802947 .00000044 00000-0 10000-3 0 222
2 20305 82.5516 314.4524 0008215 94.8440 265.3622 13.04403595214510
COBE
1 20322U 89089A 94104.04063355 .00000232 00000-0 17602-3 0 9948
2 20322 98.9803 121.0140 0009572 86.7706 273.4583 14.03432866225394
Kvant-2
1 20335U 89093A 94103.97257665 .00013670 00000-0 18011-3 0 8895
2 20335 51.6449 148.0765 0015154 139.9353 220.2171 15.58632674466024
GPS BII-05
1 20361U 89097A 94103.13371886 .00000005 00000-0 10000-3 0 7862
2 20361 55.4905 84.8709 0070755 107.6676 253.0933 2.00559568 22341
SPOT 2
1 20436U 90005A 94103.85066329 .00000095 00000-0 65161-4 0 7754
2 20436 98.7213 179.2283 0001545 49.6443 310.4869 14.20033132218960
UO-14
1 20437U 90005B 94102.72595379 .00000044 00000-0 34216-4 0 9801
2 20437 98.5909 188.3875 0011861 27.2725 332.9072 14.29836251220236
UO-15
1 20438U 90005C 94102.77168222 .00000018 00000-0 24250-4 0 7806
2 20438 98.5920 187.4813 0011063 29.3874 330.7927 14.29171437220169
PACSAT
1 20439U 90005D 94102.22422065 .00000035 00000-0 30574-4 0 7800
2 20439 98.5999 189.0565 0012191 28.4313 331.7529 14.29890613220173
DO-17
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2 23050 64.8590 350.8115 5805599 297.2768 16.0895 4.23200369 18
1994022A
1 23051U 94022A 94104.00000000 .00002040 20141-6 10000-3 0 25
2 23051 27.0058 112.5897 7642560 178.9989 166.9491 1.87600000 18
1994022B
1 23052U 94022B 94103.54629695 .00002990 -22573-4 00000+0 0 19
2 23052 27.4086 112.1876 7644683 179.0426 188.4191 1.89770306 18
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

565. STS-59 Orbital State Vectors Rev #103

Newsgroup: rec.radio.amateur.space
Date: 1994-04-16 02:28:39 UTC
From: astroman@netcom.com
Message-ID: <astromanCoByvs.9Jx@netcom.com>
Source record: 27868
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94105.75220974537
04/15/1994 18:03:10.922 UTC
EFG E: -12973117.32 ft
F: 16531670.29 ft
G: 5082428.29 ft
Edot: -6970.5533 ft/s
Fdot: -11801.3520 ft/s
Gdot: 20551.0619 ft/s
ndot/2 (drag): 0.00269101384 rev/day^2
nddt/6: 0.00000E+00 rev/day^3
Bstar: 1.09470E-04 1/Earth Radii
Elset #: 21
Rev @ Epoch: 103.04533800417

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

566. OSCAR 21 UPLINK FREQ

Newsgroup: rec.radio.amateur.space
Date: 1994-04-16 11:59:18 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <2oojum$di2@usenet.INS.CWRU.Edu>
Source record: 27869

The OSCAR 21 uplink frequency is 435.016 MHz. .015 works fine.
20 watts into a six element beam will do the trick when the
big guns aren't walking all over everybody.

Downlink is 145.987, of course.

N9LTD

567. STS-59 Orbital State Vectors Rev #119

Newsgroup: rec.radio.amateur.space
Date: 1994-04-16 22:22:12 UTC
From: astroman@netcom.com
Message-ID: <astromanCoDI51.n55@netcom.com>
Source record: 27871
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94106.79467844907
04/16/1994 19:04:20.218 UTC
EFG E: -641096.27 ft
F: 21334757.32 ft
G: -3428310.22 ft
Edot: -12617.3425 ft/s
Fdot: 2995.9034 ft/s
Gdot: 21028.2621 ft/s
ndot/2 (drag): 0.00210000000 rev/day^2
nddt/6: 1.11000E-05 rev/day^3
Bstar: 8.23724E-05 1/Earth Radii
Elset #: 23
Rev @ Epoch: 119.96977625439

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

568. STS-59 Orbital State Vectors Rev #131

Newsgroup: rec.radio.amateur.space
Date: 1994-04-17 15:18:43 UTC
From: astroman@netcom.com
Message-ID: <astromanCoEt77.G9x@netcom.com>
Source record: 27872
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94107.50361474537
04/17/1994 12:05:12.314 UTC
EFG E: 20812185.27 ft
F: 5501138.23 ft
G: 2054108.20 ft
Edot: -1195.6730 ft/s
Fdot: 12497.4835 ft/s
Gdot: -21268.3124 ft/s
ndot/2 (drag): 0.00222222220 rev/day^2
nddt/6: 1.11111E-05 rev/day^3
Bstar: 8.52332E-05 1/Earth Radii
Elset #: 27
Rev @ Epoch: 131.48183495336

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

569. STS-59 Extension Day

Newsgroup: rec.radio.amateur.space
Date: 1994-04-17 15:51:32 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-59.023.1994@ampr.org>
Source record: 27873
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-59.023
STS-59 Extension Day

Greenbelt, MD, 4/17/94 at 15:40 UTC

The STS-59 mission has been extended by one day. Landing is now set for
15:53 UTC on Tuesday April 19. This extension day provides an additional
day of SAREX operations for those interested in making a SAREX contact.

The official SAREX element set for today is still JSC-021. This element
set was generated by Gil Carman, WA5NOM, of the Johnson Space Flight Center.

STS-59
1 23042U 94020A 94105.62622017 .00203357 11079-4 10947-3 0 213
2 23042 56.9933 234.1397 0007233 279.9940 80.0358 16.22652200 1014

Satellite: STS-59
Catalog number: 23042
Epoch time: 94105.62622017 = (15 APR 94 15:01:45.42 UTC)
Element set: 021
Inclination: 56.9933 deg
RA of node: 234.1397 deg Space Shuttle Flight STS-59
Eccentricity: .0007233 Keplerian Element set JSC-021
Arg of perigee: 279.9940 deg from NASA flight Day 7 vector
Mean anomaly: 80.0358 deg
Mean motion: 16.22652200 rev/day G. L. Carman
Decay rate: 2.03357e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 101
Checksum: 271

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX

570. AMSAT via email??

Newsgroup: rec.radio.amateur.space
Date: 1994-04-17 16:15:18 UTC
From: brent@network.ucsd.edu
Message-ID: <2ornam$1v4@network.ucsd.edu>
Source record: 27874

Could someone tell me if AMSAT/NA is reachable via email, and if so, what is their address? I am unable to contact them via regular post as I am at the South Pole in Antarctica, and will not have access to regular mail until November.

In particular, I am trying to acquire a copy of the satellite tracking program "InstantTrack" which I understand is distributed by AMSAT/NA.

Please email if possible, as it is not always easy to access the newsgroups over the satellite systems.

Thanks for any help,

Brent Jones, KB1UK/KC4AAA
South Pole Communications
brent@fred.spole.gov

571. ANS-106 Bulletins

Newsgroup: rec.radio.amateur.space
Date: 1994-04-17 23:08:33 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-106.01.1994@ampr.org>
Source record: 27875
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-106.01
GARC LANDLINE BBS OPENS

HR AMSAT NEWS SERVICE BULLETIN 106.01 FROM AMSAT HQ
SILVER SPRING, MD APRIL 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-106.01

Goddard Amateur Radio Club (GARC) Landline BBS Operations Begin

The NASA Goddard Amateur Radio Club (GARC), Inc. in Greenbelt, MD has been working behind the scenes on projects that may benefit all amateur radio operators in general and perhaps AMSAT members in particular.

Ron Parise (WA4SIR) has been "beta" testing a Bulletin Board System (BBS) which is accessible via the INTERNET through telnet and ftp (file transfer protocol), a telephone modem, and packet radio (locally on 145.090 MHz and non-locally through "packet wormholes"). With Ron's heavy STS-67 crew training as of late, Jim Blackwell (N3KWU) is picking up much of the work to complete the "beta" testing phase. The BBS contains keplerian orbital elements updated daily, AMSAT bulletins, SAREX bulletins, club member mail service, club announcements, space shuttle mission infor-mation and lots more.

Access via Internet: wa3nan.gsfc.nasa.gov or 128.183.105.17
via landline: 301-286-4137
via packet: WA3NAN on 145.090 MHz in Washington, DC area

Additionally, the Goddard Amateur Radio Club has a home page for public viewing on the GARC World Wide Web server. It contains the latest GARC Newsletter in electronic form, latest space shuttle keps, GARC calendar of events, details of upcoming club activities, current WA3NAN QSL card, club facility-repeater-BBS info, a morse code experiment and more.

WWW access URL:
http://macgwy-mac2.gsfc.nasa.gov/garc/wa3nan-home-page.html

The GARC Web server was developed and is maintained by club president Jim Blackwell (N3KWU) (n3kwu@amsat.org). All radio amateurs are invited to check out its potential. This medium is the hottest item on the INTERNET today.

[The AMSAT News Service (ANS) would like to thank WD8LAQ for this bulletin item. WD8LAG can be reached at his INTERNET address of wd8laq@amsat.org.]

/EX
SB SAT @ AMSAT $ANS-106.02
AMSAT PBBS CHANGES FREQUENCY

HR AMSAT NEWS SERVICE BULLETIN 106.02 FROM AMSAT HQ
SILVER SPRING, MD APRIL 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-106.02

AMSAT PBBS Changing Frequency 15-APR-1994

The AMSAT PBBS will be changing frequency and modes starting 15-APR-1994 at 16:00 UTC. The AMSAT PBBS will be on a "Mark" freqeuncy of 14.079 MHz, that is 14.181.1 MHz AFSK LSB using the mode Pactor with the callsign WT0N. The new schedule will be as follows: Monday through Saturday from 16:00 UTC until 23:00 UTC on a "Mark" frequency of 14.079 MHz. From 23:30 UTC until 04:00 UTC on a "Mark" freqeuncy of 7.073.5 MHz, that is 7.075.6 MHz AFSK LSB, using the Mode Pactor. These changes have been made to better serve AMSAT users with improved coverage and the use of a mode that many of the users have expressed an interest in. If anyone would like to use the Mode G-TOR, please let W0TN and he will see about setting up a schedule for G-TOR users. Please send any comments or suggestions to one of the following addresses:
INTERNET: BJARTS@STTHOMAS.EDU
PACKET: WT0N@WB0GDB.#STP.MN.USA.NOAM
PACTOR: WT0N

The AMSAT PBBS will have updated Keps and AMSAT BULLETINS, along with SpaceNews and other satellite related items.

[The AMSAT News Service would like to thank B.J. Arts (WT0N) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-106.03
AO-13 OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 106.03 FROM AMSAT HQ
SILVER SPRING, MD APRIL 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-106.03

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS
18-Apr-94 0100 B 188 W5IU WA5ZIB
23-Apr-94 1800 B 180 VE2LVC W9ODI
30-Apr-94 2130 B 176 W9ODI VE2LVC

09-May-94 0000 B 175 W5IU WA5ZIB
14-May-94 1700 B 167 WA5ZIB W5IU
21-May-94 2130 B 185 VE2LVC W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

Slow Scanners are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other SSTV skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-106.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 106.04 FROM AMSAT HQ
SILVER SPRING, MD APRIL 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-106.04

Weekly OSCAR Status Reports: 16-APR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
20-Apr-94 7:35 -to- 27-Apr-94 7:55 UTC
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

STS-59: To obtain a QSL, either as a result of a SWL or for a QSL, send your report or QSL to ARRL EAD, STS-59 QSL, 225 Main Street, Newington, CT 06111, USA. Include the following information in your QSL or report: STS-59, date, time in UTC, frequency and mode (FM voice or packet). In addit-ion, you must also include an SASE (or sufficient IRCs) using a large, business-sized envelope if you wish to receive a card. The Orange Park Amateur Radio Club in Florida has generously volunteered to manage the cards for this mission. [Bob Inderbitzen (NQ1R) Assistant to the Manager,

ARRL Educational Activities]

KO-23: Working well and has a new pair of images. [WH6I]

KO-25: Working well. A number of new images can be found on KO-25 but since the wide angle images are in a new format that so far has not been decoded, and since narrow angle images are very hard to locate in the absence of the companion wide angle image there is very little to get out of the images that are available. [WH6I]

AO-16: Working well. WH6I notes that usage on the 1200 baud OSCARS has has dropped off considerably. [WH6I]

LO-19: Working well. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

572. STS-59 Orbital State Vectors Rev #136

Newsgroup: rec.radio.amateur.space
Date: 1994-04-17 23:23:26 UTC
From: astroman@netcom.com
Message-ID: <astromanCoFFn2.1F1@netcom.com>
Source record: 27876
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94107.79300026620
04/17/1994 19:01:55.223 UTC
EFG E: -11103871.23 ft
F: 8436401.26 ft
G: 16498661.41 ft
Edot: -4098.3934 ft/s
Fdot: -22668.5737 ft/s
Gdot: 8830.5125 ft/s
ndot/2 (drag): 0.00222222220 rev/day^2
nddt/6: 1.11111E-05 rev/day^3
Bstar: 8.31548E-05 1/Earth Radii
Elset #: 28
Rev @ Epoch: 136.18231622566

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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573. Satellite Receive Dishes Combined in Phase Array

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 00:28:21 UTC
From: weening@convex.csd.uwm.edu
Message-ID: <2osk75INN7mv@uwm.edu>
Source record: 27877
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

Is anyone aware of successful methods for combining two or more satellite receive dishes in phase array as a means of achieving receive gain comparable to a single larger dish? Is there a Usenet Group concerned with the engineering aspects of satellite broadcasting and receive technology? Thanks

574. STS-59 Orbital State Vector Rev #141

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 04:34:37 UTC
From: astroman@netcom.com
Message-ID: <astromanCoFu1p.BCH@netcom.com>
Source record: 27878
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94108.09200031250
04/18/1994 02:12:28.827 UTC
ECI X: -13736949.086477 ft
M50 Y: -16065847.282498 ft
Z: 4471154.181108 ft
Xdot: 13703.96875 ft/s
Ydot: -5940.96094 ft/s
Zdot: 20716.46875 ft/s
ndot/2 (drag): 0.00251143221 rev/day^2
nddt/6: 1.11111E-05 rev/day^3
Bstar: 9.24140E-05 1/Earth Radii
Elset #: 29
Rev @ Epoch: 141.03924592732

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

575. Is there a definitive list of freqs for the weather sats?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 07:39:22 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CoG2Ln.EGI@bbc.co.uk>
Source record: 27879

I am after a list of freqs for the low orbit weathe sats.

Can anyone help me?

john B

john.boyer@rd.eng.bbc.co.uk

576. STS-59 mission extended

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 12:49:40 UTC
From: marcbg@netcom.com
Message-ID: <$sts59023.1994@ampr.org>
Source record: 27880
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

Greenbelt, MD, 4/17/94 at 15:40 UTC

The STS-59 mission has been extended by one day. Landing is now set for
15:53 UTC on Tuesday April 19. This extension day provides an additional
day of SAREX operations for those interested in making a SAREX contact.

The official SAREX element set for today is still JSC-021. This element
set was generated by Gil Carman, WA5NOM, of the Johnson Space Flight Center.

STS-59
1 23042U 94020A 94105.62622017 .00203357 11079-4 10947-3 0 213
2 23042 56.9933 234.1397 0007233 279.9940 80.0358 16.22652200 1014

Satellite: STS-59
Catalog number: 23042
Epoch time: 94105.62622017 = (15 APR 94 15:01:45.42 UTC)
Element set: 021
Inclination: 56.9933 deg
RA of node: 234.1397 deg Space Shuttle Flight STS-59
Eccentricity: .0007233 Keplerian Element set JSC-021
Arg of perigee: 279.9940 deg from NASA flight Day 7 vector
Mean anomaly: 80.0358 deg
Mean motion: 16.22652200 rev/day G. L. Carman
Decay rate: 2.03357e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 101
Checksum: 271

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
--
Marc Grant Voice Mail: 214-246-1150
home: marcbg@netcom.com work: marcbg@esy.com Amateur Radio N5MEI

577. Re: Satellite Receive Dishes Combined in Phase Array

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 12:56:06 UTC
From: anderson@kosepc01.delcoelect.com
Message-ID: <1994Apr18.125606.21991@kocrsv01.delcoelect.com>
Source record: 27881
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

In <2osk75INN7mv@uwm.edu>, weening@convex.csd.uwm.edu (Richard W Weening) writes:
>
>Is anyone aware of successful methods for combining two or more satellite receive dishes
>in phase array as a means of achieving receive gain comparable to a single
>larger dish? ^^^^

I've always seen phased antenna arrays used for more precise pointing, not
for increased gain. Of course, with a narrower "beam" you GET more gain,
so maybe it isn't as unusual an idea as it first seemed....

========
Alan Anderson (Wb9RUF) [no fancy .sig -- yet]

578. Re: Satellite Receive Dishes Combined in Phase Array

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 14:25:17 UTC
From: mack@ncifcrf.gov
Message-ID: <CoGLE6.Ju9@ncifcrf.gov>
Source record: 27882
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

In article <2osk75INN7mv@uwm.edu> weening@convex.csd.uwm.edu (Richard W Weening) writes:
>
>Is anyone aware of successful methods for combining two or more satellite receive dishes
>in phase array as a means of achieving receive gain comparable to a single
>larger dish? Is there a Usenet Group concerned with the engineering aspects
>of satellite broadcasting and receive technology? Thanks

COmbinng antennas into arrays is covered in most texts on antennas. You
will have to do it at receive frequency and feed the power to a combiner. The
pointing accuracy needed will be approx that for an antenna with the diam=
spacing between the two dishes (ie you'll need to be very accurate), while
the signal will only go up 3bd. This is great for radia astronomy where you
want to know exactly where your source is. However you just want more
signal, in which case it will be easier to buy a bigger dish.

Joe Mack NA3T
mack@ncifcrf.gov

579. APT-Satellites: Report APR 16, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 15:09:27 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-180494150930@129.26.163.240>
Source record: 27883
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, APR 16, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 3-5: APT 137.85 On

NOAA-10 is near NOAA-12. Thus NOAA-10 APT is OFF to avoid
interference caused by two visible transmitters using the
same frequency. (VHF-conflict)
```


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

580. * SpaceNews 18-Apr-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 16:02:16 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0418.1994@ampr.org>
Source record: 27884
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info
Body handling: HTML body converted to readable text

```
SB NEWS @ AMSAT $SPC0418
* SpaceNews 18-Apr-94 *

BID: $SPC0418

=========
SpaceNews
=========

MONDAY APRIL 18, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* STS-59 SAREX NEWS *
====================
The following are some packet frames received from the Space Shuttle
Endeavour by Andy, WA5ZIB:

W5RRR-1>SAREX [04/12/94 10:13:38] :
This is STS-59 SAREX Robot station W5RRR-1
onboard the Space Shuttle Endeavour.

W5RRR-1>QST [04/12/94 10:14:01] :
Thanks to all of you hams who have connected to our packet station
and worked us on voice! It really makes us feel closely connected
to the people and places that we are flying over. On board Endeavour
things are working very well - the scientists are very happy with the
data they are acquiring. I am very happy to be back in space, and it
all feels very familiar and nice. Our crew has been very well trained,
and we were able to accomplish all our tasks as scheduled so far.
We have had some spectacular views of Earth - we just flew over Tahiti,
for example.

73, N5QWL
12 April 1994 02:20 UTC

QSLs are available through the ARRL at the following address:

ARRL
ATTN: STS-59 QSLs
225 Main Street
Newington, CT 06111
USA
```

Include a self-addressed stamped envelope (SASE) with your QSL. Non-US stations should include a self addressed envelope with $0.50 of US postage affixed or appropriate IRCs. Include the callsign worked, date, UTC, mode, and frequency. For packet contacts, include the QSO number issued by the Robot. SWL QSLs: Include the callsign heard, date, UTC, mode, and frequency.

* SOLAR ECLIPSE INFORMATION *
==========
On 1994 May 10 (Tue), an annular solar eclipse will be visible throughout North and Central America. The May issue of "Sky & Telescope" (p 72ff) details this event, the last of its type visible in the continental US until 2012 May 20.

Scott, KF9QK, plans to monitor 10-meter beacons for the effect of the eclipse on radio propagation. Of interest is a predicted 'bow shock' effect on ionospheric propagation as the annular eclipse proceeds, so amateurs should plan observations well ahead and after their astronomical eyeball brethren. Observations of any effect on V/UHF propagation are also of interest. A log of conditions before, during and after the event would be most helpful. "Sky & Telescope" provides the needed planning information. Radio observers, of course, need not worry about atmospheric conditions.

Weather-wise, observers can also expect noticeable shifts in temperature, pressure and wind during the annular eclipse. An observer in Indiana has requested such information, which, if forwarded to KF9QK, will be relayed. Again, the better the log, the more it's worth.

Scott may be reached via packet radio at: KF9QK @ N9HSI.IL.USA.NOAM

[Info via KF9QK]

* AMSAT PBBS MOVE *
==========
The AMSAT PBBS changed frequency and modes on April 15th at 1600 UTC. The AMSAT PBBS will be on a Mark frequency of 14.079 MHz, (that's 14.1811 MHz AFSK LSB), using Pactor with the callsign WT0N. The new schedule will be as follows: Monday through Saturday from 1600 UTC until 2300 UTC on a Mark freqeuncy of 14.079 MHz. From 2330 UTC until 0400 UTC on a Mark freqeuncy of 7.0735 MHz (that's 7.0756 MHz AFSK LSB), using Pactor. These changes have been made to better serve AMSAT users with greater coverage and use of a mode that many of the users have expressed an interest in. If anyone would like to use the Mode G-TOR, please let WT0N know and he will see about setting up a schedule for G-TOR users. Please send any comments or suggestions to one of the following:

INTERNET: BJARTS@STTHOMAS.EDU
PACKET: WT0N@WB0GDB.#STP.MN.USA.NOAM
PACTOR: WT0N

The AMSAT PBBS will have updated Keps and AMSAT bulletins, along with SpaceNews and other satellite related items.

[Info via BJ Arts, WT0N]

* JOHNSON SPACE CENTER BBS INFORMATION *
==
The Johnson Space Center Amateur Radio Club has set up a telephone computer bulletin board (BBS). The purpose of the BBS is to provide a source of current Space Shuttle mission Keplerian Elements.

There are limited number of BBS files available for downloading.
Among the current files are:
o Current and old element sets for the mission in progress
o Current mission information
o Shuttle Amateur Radio Experiment (SAREX) information
o Recent Space Shuttle Mission Schedules and Manifests
o Astronaut/Cosmonaut Ham List
o Current JSC Amateur Radio Club Newsletter

We ask that no files be uploaded to the BBS.

The telephone number is (713) 244-5625. The speed is anything up to 9600 baud. The parameters are N-8-1.

The BBS is currently running in ProComm HOST mode, so the log on is very simple and downloading is easy.

After logging in you will see the Welcome Screen describing the BBS. Also, the Welcome Screen contains the current and latest element set number (e.g., JSC008) loaded on the BBS. Check it against your last set so you won't waste your time duplicating a set you already have.

Press ENTER to bring up the second page containing the current Space Shuttle Keplerian Element Set. If you have a file capture or screen capture function in your communications software, use it for this page. That way, you won't have to go through the file download process if all you wanted was the latest element set.

If you have any comments for the Club or BBS sysop, leave a message and the sysops will respond.

Dale Martin, KG5U @ KA5KTH.#SETX.TX.USA.NA
Secretary, Johnson Space Center ARC
Houston, Texas

* AMATEUR SPACE SHOT *
======================
With funding from the National Space Society, the Pacific Rocket Society (PRS) is building a nitric acid/furfuryl alcohol rocket designed to achieve an altitude of 80 kilometers--the edge of space.

Of interest to the AMSAT folks is the television and data telemetry payload designed and built by Duncan Cumming, KD6GKE. (Duncan is a native of Birmingham England and holds a PhD in Electrical Engineering from Cambridge University.) The system transmits video from a small security camera at 434 MHz and data at 145.75 MHz.

The data channels include GPS, magnetometer, accelerometer, altimeter, launch detector, engine temperatures and pressures and status switches. The heart of the system is a Tattletale IV single board 6303 based computer.

An article on Duncan's telemetry system, co-authored by George Morgan, WB6ZUV, appears in the April 1994 issue of "High Power Rocketry."

The launch will be from the Pacific Rocket Society test site in the Mojave Desert later this year.

The PRS meets monthly in the physics classroom of Chaminade College Preparatory, West Hills, California. Inquiries about the project can be sent to PRS president Charles Pooley, KD6HKU at ckp@netcom.com or to Dave Reeves at kf6pj@amsat.org or chaminade@amsat.org.

[Info via Dave Reeves, KF6PJ/WA6BYE]

* FO-20 SCHEDULE *
==========
The FO-20 command station announced that FO-20 will be placed in Mode JA (Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through 26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:
20-Apr-94 07:35 -to- 27-Apr-94 07:55 UTC
11-May-94 06:54 -to- 18-May-94 07:20 UTC

Digital mode:
Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

N9QKD WT0N

and Bob, N7PTM, who uploads SpaceNews to the GEnie telephone BBS system. Bob places SpaceNews in the Radio and Electronics section, and is told it is available in the Space section as well.

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

581. STS-59 Element Set (94108.643)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 16:47:13 UTC
From: elements-request@alsys.com
Message-ID: <STS-59.94108.643@alsys.com>
Source record: 27885
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-59
1 23042U 94020A 94108.64356620 .00203357 11079-4 10947-3 0 223
2 23042 56.9938 219.5250 0008385 295.2758 64.7483 16.24015035 1504

Satellite: STS-59
Catalog number: 23042
Epoch time: 94108.64356620 = (18 APR 94 15:26:44.11 UTC)
Element set: 022
Inclination: 56.9938 deg
RA of node: 219.5250 deg Space Shuttle Flight STS-59
Eccentricity: .0008385 Keplerian Element set JSC-022
Arg of perigee: 295.2758 deg from NASA flight Day 10 vector
Mean anomaly: 64.7483 deg
Mean motion: 16.24015035 rev/day G. L. Carman
Decay rate: 2.03357e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 150

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
```

582. Re: On-line satellite schedules?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 17:34:48 UTC
From: CSLE87@email.mot.com
Message-ID: <CSLE87-180494133450@145.39.1.10>
Source record: 27886

In article <CnEEwy.Kpy@freenet.carleton.ca>, ag381@FreeNet.Carleton.CA
(Herb Dieben) wrote:

>
>
> In a previous article, awoodhull@hamp.hampshire.edu () says:
>
> >Is there an on-line source of data about Oscar and RS satellite schedules
> >of operation?
> >
> > Albert S. Woodhull
> > Hampshire College, Amherst, MA, USA
> > awoodhull@hamp.hampshire.edu
> >
> Let me know if you find one.
> Thanks,Herb
> >

You are both in the right place. The orbital data appears here regularly,
and
is usually titled $ORBnnn.type, where the "nnn" is a sequentially assigned
number and the "type" may be weather (WX), amateur (OSCAR) or other fairly
easily decoded suffix. You may also see the title containing the word
"KEPS,"
short for Keplerian orbital data.

Recently several folks have been posting their own original works or
duplicates of the ARRL and AMSAT listings into the rec.radio.amateur.misc
newsgroup, which is strongly discouraged. Keep looking here, you'll find
much valuable news here, including SpaceNews, the AMSAT bulletins, and
other
helpful info.

--
Karl Beckman, P.E. < STUPIDITY is an elemental force for which >
Motorola Comm - Fixed Data < no earthquake is a match. -- Karl Kraus >

The statements and opinions expressed here are not those of Motorola Inc.
Motorola paid a marketing firm a huge sum of money to get their opinions;
they have made it clear that they do not wish to share those of employees.

Amateur radio WA8NVW @ K8MR.NEOH.USA.NA NavyMARS VBH @ NOGBN.NOASI

583. STS-59 Orbital State Vector Rev #151

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 21:52:48 UTC
From: astroman@netcom.com
Message-ID: <astromanCoH640.AGD@netcom.com>
Source record: 27887
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94108.75165878472
04/18/1994 18:02:23.319 UTC
EFG E: 11352359.29 ft
F: 3215735.26 ft
G: -18105476.33 ft
Edot: -5497.5132 ft/s
Fdot: 24012.4114 ft/s
Gdot: 827.8732 ft/s
ndot/2 (drag): 0.00250000000 rev/day^2
nddt/6: 1.11000E-05 rev/day^3
Bstar: 8.99829E-05 1/Earth Radii
Elset #: 31
Rev @ Epoch: 151.75621515941

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

584. satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-04-18 22:56:29 UTC
From: serapions@delphi.com
Message-ID: <9404181849594.serapions.DLITE@delphi.com>
Source record: 27888

Hello,
My name is Paul and recently I have been reading a great book about satellites. The following is information that was covered in the first chapters.

A magnetic torquer is basically a rod with a coil wrapped around it. The direction of current into the coil can be changed. Torquers are used to counteract the earths magnetic field, as well as residual forces of the spacecraft. A magnetic dipole moment is produced when the coil is energized, defined as:
dipole moment = pole strength X distance between poles

A nutation damper is a tube partially filled with mercury and mounted on the spacecraft deck. It is a viscous damper, which damps out "nutation", (a "wobbly axis").

During the Hubble telescope repair, we heard a lot about Magnetometers. These are devices which measure the strength of a magnetic field, and also its direction. In its simplist form it is a solenoid coil with a ferromagnetic core. As it passes through the earths magnetic field a proportional output curreroduced.

Tracking refers to following, and plotting the path of an object. Telemetry, refers to the process of obtaining samples of data from various sensors and then transmitting the data to an earth station. The data from the sensors is first encoded and then modulated onto an RF carrier. The modulated carrier is transmitted to earth. A sensor measures some parameter such as radiation, temperature, pressure, or speed (RPM), and changes it into an electrical signal, which can be processed by a computer. Time division multiplexing or frequency division multiplexing are used to place all of the "telemetry data" on a single carrier.
Does anyone know the bandwidth requirement for telemetry (esp. PCM)?
Please leave a reply or contact "Paul" via Internet, my address is:
Serapions@delphi.com

585. Point me to the FAQ please...

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 01:56:57 UTC
From: Kenneth.E.Harker@Dartmouth.Edu
Message-ID: <2ovdp9$jnc@dartvax.dartmouth.edu>
Source record: 27889

Can someone point me to the FAQ for amateur satellites? I don't
seem to see it here or in rec.radio.info. I figure it is the best
place to start.
Also, if anyone knows of other net or hard copy resources that
could get
someone interested in getting into low power/low expense casual
satellite activity (who is currently fairly clueless about it all), I
would be very interested.
Thanks in advance...

==
Kenneth E. Harker N1PVB Dartmouth College Amateur Packet Radio
kenneth.e.harker@dartmouth.edu Hinman Box 1262 n1pvb@w1et.nh.usa.na
(603) 643-5716 Hanover, NH 03755 or n1pvb-5 on 144.99
==
(PGP Public Key now available on request)

586. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 04:42:29 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766730549@afit.af.mil>
Source record: 27890

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94107.91666667 .00025849 11135-4 10898-4 0 314
2 23042 56.9922 223.0523 0007875 294.2887 134.4999 16.23816294 1372
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

587. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 04:42:45 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766730565@afit.af.mil>
Source record: 27891
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

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STS 59
1 23042U 94020A 94107.91666667 .00025849 11135-4 10898-4 0 314
2 23042 56.9922 223.0523 0007875 294.2887 134.4999 16.23816294 1372
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

588. Re: Satellite Receive Dishes Combined in Phase Array

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 11:15:53 UTC
From: jpll@vectorbd.com
Message-ID: <CoI7AH.C4r@vectorbd.com>
Source record: 27892
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

Richard W Weening (weening@convex.csd.uwm.edu) wrote:

: Is anyone aware of successful methods for combining two or more
: satellite receive dishes in phase array as a means of achieving receive
: gain comparable to a single larger dish?

combining will gain you +3B in ideal condx. This can be easily done on vhf.
On 1296 (a ham band) and above combiner losses are a pain. at C band (4GHz)
a wavelength gets pretty tiny, and the combiners must be very accurate
in mechanical dims. It's easy to get 1dB of mismatch loss.

Bottom line is, the answer is no for most of us. Better to extend the dish
with some "pedals" or to examine if you have ground noise getting in.

--
- -
-Jim Lill- Vector Board BBS
jpll@vectorbd.com 716-544-1863/2645
wa2zkd@wb2psi.#wny.ny.usa.na GEnie: ZKD

589. Re: Satellite Receive Dishes Combined in Phase Array

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 11:59:47 UTC
From: weverka@spot.Colorado.EDU
Message-ID: <CoI9Bo.5F6@cnsnews.Colorado.EDU>
Source record: 27893
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

In article <1994Apr18.125606.21991@kocrsv01.delcoelect.com>,
Alan Anderson <anderson@kosepc01.delcoelect.com> wrote:
>>In <2osk75INN7mv@uwm.edu>, weening@convex.csd.uwm.edu (Richard W Weening):
>>>
>>>Is anyone aware of successful methods for combining two or more satellite
>>>receive dishes in phase array as a means of achieving receive gain
>>>comparable to a single larger dish? ^^^^
>>
>>I've always seen phased antenna arrays used for more precise pointing, not
>>for increased gain. Of course, with a narrower "beam" you GET more gain,
>>so maybe it isn't as unusual an idea as it first seemed....
>>
phased array antennas are commonly used to acheive gain.

In article <CoGLE6.Ju9@ncifcrf.gov>, Joe Mack <mack@ncifcrf.gov> wrote:
> COmbinng antennas into arrays is covered in most texts on antennas. You
>will have to do it at receive frequency and feed the power to a combiner. The
>pointing accuracy needed will be approx that for an antenna with the diam=
>spacing between the two dishes (ie you'll need to be very accurate), while
>the signal will only go up 3bd. This is great for radia astronomy where you
>want to know exactly where your source is. However you just want more
>signal, in which case it will be easier to buy a bigger dish.
>

You don't have to point the individual antennas in an array any better than
you would have to point them by them selves. You do have to match the line
lengths from the antennas to the power combiner at the higher pointing
accuracy, but this is relatively easy. In fact with a variable line length
you can steer the combined beam anywhere within the main beam of the
single dish.

You don't have to combine the signals at the carrier frequency either, if
the two downconverters are driven by the same local oscilator.
A high frequency power combiner might be cheap than two down converters.

Whether a big dish is easier than a few small dishes, depends on whether
you are more adept at mechanics or electronics, and how often you need
to reposition your dish.

590. Re: AMSAT HF PBBS MOVE

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 13:20:28 UTC
From: CSLE87@email.mot.com
Message-ID: <CSLE87-190494092029@145.39.1.10>
Source record: 27894
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.digital.misc

In article <$arts-094.1994@ampr.org>, BJARTS@stthomas.edu (B J Arts) wrote:

> SB PBBS@AMSAT $ARTS-094
> AMSAT PBBS MOVE
>
> The AMSAT PBBS will be changing frequency and modes starting April
> 15th at 1600 UTC. The AMSAT PBBS will be on a Mark frequency of 14.079,
> that's (14.181.1 AFSK LSB), using the mode Pactor with the callsign WT0N.
?
NO, actually it should read 14.081.1 (minor typing error), and if you are
running a Kenwood you will want to center-tune at 14.081.2 instead. This
will put mark at the requested frequency with space 200 hz down from there.

If you have trouble copying, remember to also check your TNC's TxRev and
RxRev settings when running inverted like this.

> The new schedule will be as follows: Monday THRU Saturday from 1600 UTC
> until 2300 UTC on a Mark freqeuncy of 14.079. From 2330 UTC until 0400 UTC
> on a Mark freqeuncy of 7.073.5 that's (7.075.6 AFSK LSB), using the Mode
> Pactor. These changes have been made to better serve AMSAT users with better
> coverage and use of a mode that many of the users have expressed an interest
> in. If anyone would like to use the Mode G-TOR, please let me know and I
> can see about setting up a schedule for G-TOR users. Please send any
> comments or suggestions to one of the following:
> INTERNET: BJARTS@STTHOMAS.EDU
> PACKET: WT0N@WB0GDB.#STP.MN.USA.NOAM
> PACTOR: WT0N
>
> The AMSAT PBBS will have updated Keps and AMSAT BULLETINS, along with
> SpaceNews and other satellite related items.
>
> 73 AND THANKS FOR YOUR TIME AND INTEREST THE AMATEUR SATELLTIE PROGRAM
> de BJ ARTS WT0N
>
> /EX

--
Karl Beckman, P.E. < STUPIDITY is an elemental force for which >
Motorola Comm - Fixed Data < no earthquake is a match. -- Karl Kraus >

The statements and opinions expressed here are not those of Motorola Inc.
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they have made it clear that they do not wish to share those of employees.

Amateur radio WA8NVW @ K8MR.NEOH.USA.NA NavyMARS VBH @ NOGBN.NOASI

591. Meteor scatter software V4.2 de OH5IY

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 16:30:32 UTC
From: jsi@vipunen.hut.fi
Message-ID: <2p10v8$fpu@nntp.hut.fi>
Source record: 27895

Good news for meteor scatter freaks !

Version 4.2 of OH5IY's meteor scatter software has been released today.
I have uploaded it into ftp.funet.fi: pub/ham/vhf-work/mssoft42.zip.

V4.2 has lots of improvements and changes compared to V4.1. The most
exciting new feature is true, measured activity of major showers. The
graphs show the profile of each shower 96 hrs around the peak. This is
something you really want to lay your hands on !!

Other new features or changes include:

- bar graphics ZHR history for major showers since 1980.
- updated shower data and improved peak calculation algorithms.
- meteor speed correction factor used in computing ant. elevation.
- sidescatter optimum elevations computed.
- day scanning on gradient curves with EGA&VGA.
- single screen shows all numeric gradient data.
- improved text editor and find function in sked-editor.
- improved install and default parameter setting program.
- better error handling.
- mouse control.
- creates \ms and \msdata subdirectories
- installs on any existing subdirectory.
- report can be sent 2 or 3 times on CW.

There are many new features not listed above. See readme42.com to find
them all.

If you are using this software, send a message to OH5IY for his records.
If you send your packet or e-mail address, you will get the new data files
automatically after each shower. OH5IY's e-mail and packet addresses are
mentioned in the end of readme42.com.

If you can't ftp but want a copy of the new version, send a formatted 3.5"
HD disk with 4 IRCs (or equal amount of USD) inside Europe, 6 IRCs outside
Europe, + Self Addressed Envelope (SAE) to Ilkka Yrjola OH5IY, Jukolan tie 16,
FIN-45740 Kuusankoski, Finland.

The first copies of the new version will be mailed out this week.

The latest version is always available by anonymous ftp at ftp.funet.fi
(128.214.6.100): pub/ham/vhf-work/mssof*.zip. The new versions will named
as mssof421.zip, mssof422.zip, mssoft43.zip etc. (Hint: use pkunzip -d to
open the .zip file). In future look also for msdata94.zip, which will
contain all new data files. It will be updated after each shower.

--
Jukka OH6DD jsi@hut.fi

592. OH5IY's meteor scatter S/W V4.2 released

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 16:56:58 UTC
From: Jukka Tapio Sirvi| <jsi@vipunen.hut.fi>
Message-ID: <199404191656.AA33632@vipunen.hut.fi>
Source record: 27896
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.info

Good news for meteor scatter freaks !

Version 4.2 of OH5IY's meteor scatter software has been released today.
I have uploaded it into ftp.funet.fi: pub/ham/vhf-work/mssoft42.zip.

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exciting new feature is true, measured activity of major showers. The
graphs show the profile of each shower 96 hrs around the peak. This is
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- bar graphics ZHR history for major showers since 1980.
- updated shower data and improved peak calculation algorithms.
- meteor speed correction factor used in computing ant. elevation.
- sidescatter optimum elevations computed.
- day scanning on gradient curves with EGA&VGA.
- single screen shows all numeric gradient data.
- improved text editor and find function in sked-editor.
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- installs on any existing subdirectory.
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FIN-45740 Kuusankoski, Finland.

The first copies of the new version will be mailed out this week.

The latest version is always available by anonymous ftp at ftp.funet.fi
(128.214.6.100): pub/ham/vhf-work/mssof*.zip. The new versions will named
as mssof421.zip, mssof422.zip, mssoft43.zip etc. (Hint: use pkunzip -d to
open the .zip file). In future look also for msdata94.zip, which will
contain all new data files. It will be updated after each shower.

--
Jukka OH6DD jsi@hut.fi

593. Re: Meteor scatter software V4.2 de OH5IY

Newsgroup: rec.radio.amateur.space
Date: 1994-04-19 22:26:17 UTC
From: jsi@vipunen.hut.fi
Message-ID: <2p1lq9$s85@nntp.hut.fi>
Source record: 27897

>The latest version is always available by anonymous ftp at ftp.funet.fi
>(128.214.6.100): pub/ham/vhf-work/mssof*.zip. The new versions will named

I have just found out that the IP-address of ftp.funet.fi has changed to
128.214.248.6 . I am not sure when this has happened, but for me the old one
seems to work aswell as the new ... A report from UK tells that the old
address is not valid any more. Fortunately, the name ftp.funet.fi works
in most cases. But if it doesn't, try the new IP-address.

Jukka OH6DD

594. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 00:36:07 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766802167@afit.af.mil>
Source record: 27898

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 59
1 23042U 94020A 94108.91666667 .00027498 11147-4 11102-4 0 342
2 23042 56.9904 218.1997 0007553 293.0523 224.3536 16.24255567 1534
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

595. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 00:36:23 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.766802183@afit.af.mil>
Source record: 27899
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

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--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

596. STS-59 Orbital State Vector Rev #171

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 01:14:15 UTC
From: astroman@netcom.com
Message-ID: <astromanCoJA3r.8Lp@netcom.com>
Source record: 27900
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-59
Catalog Number: 23042 94020A
Epoch Date/Time: 94109.93851142361
04/19/1994 22:31:27.386 UTC
ECI X: -15798527.666878 ft
M50 Y: -13887693.133386 ft
Z: 4910985.018417 ft
Xdot: 13080.71094 ft/s
Ydot: -7585.49609 ft/s
Zdot: 20583.45703 ft/s
ndot/2 (drag): 0.00274980000 rev/day^2
nddt/6: 1.11470E-05 rev/day^3
Bstar: 1.11020E-05 1/Earth Radii
Elset #: 33
Rev @ Epoch: 171.04319961962

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

597. Question...

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 05:40:10 UTC
From: Patrick.Signs@f747.n115.z1.fidonet.org
Message-ID: <2db5068a@f747.n115.z1.fidonet.org>
Source record: 27901

I am interested into working the PacSats. Will it require me to have to buy two data radios or would one radio with 440receive and full duplex operation work? Particularly looking at the new IC-281H(I believe still pending FCC approval). Any help would be appreciated.

N6KOI - Pat

598. Re: On-line satellite schedules?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 16:57:13 UTC
From: pschleck
Message-ID: <pschleck.766861033@cwis>
Source record: 27902

In <CSLE87-180494133450@145.39.1.10> CSLE87@email.mot.com (Karl Beckman) writes:

>In article <CnEEwy.Kpy@freenet.carleton.ca>, ag381@FreeNet.Carleton.CA
>(Herb Dieben) wrote:

>>
>>
>> In a previous article, awoodhull@hamp.hampshire.edu () says:
>>
>> >Is there an on-line source of data about Oscar and RS satellite schedules
>> >of operation?
>> >
>> > Albert S. Woodhull
>> > Hampshire College, Amherst, MA, USA
>> > awoodhull@hamp.hampshire.edu
>> >
>> Let me know if you find one.
>> Thanks,Herb
>> >

>You are both in the right place. The orbital data appears here regularly,
>and
>is usually titled $ORBnnn.type, where the "nnn" is a sequentially assigned
>number and the "type" may be weather (WX), amateur (OSCAR) or other fairly
>easily decoded suffix. You may also see the title containing the word
>"KEPS,"
>short for Keplerian orbital data.

>Recently several folks have been posting their own original works or
>duplicates of the ARRL and AMSAT listings into the rec.radio.amateur.misc
>newsgroup, which is strongly discouraged. Keep looking here, you'll find
>much valuable news here, including SpaceNews, the AMSAT bulletins, and
>other
>helpful info.

I agree that single-maintainer distribution for FAQ's and bulletins is
desirable under most circumstances. The down side is that a single
maintainer is also a single point-of-failure. A very powerful technique
for allowing multiple posters without duplication at any site is
available within Usenet news (essentially a hack of the Message-ID,
similar to the BID system on amateur packet radio). Currently the
rec.radio.info moderator coordinates several posters of ARRL bulletins,
mapping the packet bids to Usenet Message ID's. For example, ARRL Space
Bulletin 20 with a packet BID of $ARLS020 would map to:

Message-ID: <$arls020.1994@ampr.org>

Technically, Message ID's should contain the domain of the originating station, but since users from several domains may post the bulletins, and ultimately the bulletins may be considered to originate from amateur packet radio, making ampr.org the domain resolves the issue without subverting the intent of RFC 1036 too much (the addition of the year to the BID makes it unique indefinitely, which RFC 1036 strongly recommends).

Since the orbital elements have their own BID convention (starting with $ORB), such a multiple-poster arrangement can be used for them as well. If anyone is interested in becoming a volunteer "bulletin station" for Usenet for any bulletins with BIDS, contact the rec.radio.info moderator at rec-radio-request@ve6mgs.ampr.ab.ca. In this way, we can keep the information flowing fast and regularly without burdening any one person or small group of people too much while avoiding unnecessary duplication.

73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

599. Re: STS-59 Orbital State Vector Rev #171

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 19:43:23 UTC
From: ryche72@sylvester.cc.utexas.edu
Message-ID: <2p40kr$srk@sylvester.cc.utexas.edu>
Source record: 27903
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

Are there any programs that use the OSVs for the mac to trak the shuttle?
Will these work with Orbitrack?
Also, where can a mac program be found to plot the track against the star background?

Any info appreciated

Drew Yacenda
Aerospace Engineering, UT Austin

600. QRP satellite work

Newsgroup: rec.radio.amateur.space
Date: 1994-04-20 21:41:09 UTC
From: Kenneth.E.Harker@Dartmouth.Edu
Message-ID: <2p47hl$1q1@dartvax.dartmouth.edu>
Source record: 27904

I've been thinking of getting into amateur satellite work lately.
Just sort of rummaging through my AES catalog as a general benchmark
for prices, I've decided that the "top-end" satellite station, from
what I've read would be something like a Yaesu FT-736R transceiver, a
Yaesu G-5400B alt/az rotor w/ computer interface, a pair of KLM
circularly polarized yagis, a fiberglass boom, some sort of mount, an
amp/preamp, 15 to 30m of Belden 9913 and 8448 cable, a PC to run the
rotor controller software and tracking software, etc... around $5000US
or thereabouts.
Which is about $5000 more than what I have to spend right now :-)
My current setup is used mostly for packet and consists of a macintosh
computer, an unmodified Alinco DJ-580T, a KPC-3 TNC, an Astron RS-20A,
and a Hustler dualband base station vertical at about 15m above ground.
My question is what sort of satellite work can I do with this setup?
Anything? What sort of supplements could I add to it to work sats?
From what I have read so far, almost all of the satellites seem to
use SSB/CW. Can anything be done with FM? How does packet work? In
general, can anything be worked with a vertical ground plane antenna,
or do you have to use yagis with alt/az rotation? Is anything workable
on 5W, or would I really need an amp/preamp?
In short, is there anything I can do with my current setup, or
should I wait for five or six years until I'm out of school and can
afford to invest in this sort of equipment?

==
Kenneth E. Harker N1PVB Dartmouth College Amateur Packet Radio
kenneth.e.harker@dartmouth.edu Hinman Box 1262 n1pvb@w1et.nh.usa.na
(603) 643-5716 Hanover, NH 03755 or n1pvb-5 on 144.99
==
(PGP Public Key now available on request)

601. Mir QSL?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-21 00:04:03 UTC
From: Greg <laborde@elm.jpl.nasa.gov>
Message-ID: <2p4ftj$roh@elroy.jpl.nasa.gov>
Source record: 27905

OK, I finally got through to Mir. A beautiful connect too. I uploaded a message, listed the messages, uploaded another, all in 2 minutes. This was over LA. One has to wonder what was wrong...

So how does one QSL Mir?

-Greg

602. STS-60 QSL?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-21 00:05:05 UTC
From: Greg <laborde@elm.jpl.nasa.gov>
Message-ID: <2p4fvh$roh@elroy.jpl.nasa.gov>
Source record: 27906

Has anyone received an STS-60 QSL yet?

-Greg
laborde@oak.jpl.nasa.gov

603. Keplerian Bulletin 15 ARLK015

Newsgroup: rec.radio.amateur.space
Date: 1994-04-21 12:40:35 UTC
From: marcbg@netcom.com
Message-ID: <$arlk015.1994@ampr.org>
Source record: 27907
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

```
ZCZC SK82
QST de W1AW
Keplerian Bulletin 15 ARLK015
>From ARRL Headquarters
Newington, CT April 16, 1994
To all radio amateurs

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94093.93015575 -.00000105 10000-3 0 2736
2 14129 27.1781 334.0078 6020533 167.5108 219.1680 2.05877978 53285
RS-10/11
1 18129U 87054A 94104.20127577 0.00000016 14274-5 0 8891
2 18129 82.9269 16.1383 0010438 196.2914 163.7905 13.72334612341134
UO-11
1 14781U 84021B 94101.00958292 0.00000306 59703-4 0 6809
2 14781 97.7900 118.8735 0012594 120.8281 239.4170 14.69188820540441
RS-12/13
1 21089U 91007A 94104.30260014 0.00000030 15640-4 0 6798
2 21089 82.9197 58.8219 0028099 289.1188 70.6929 13.74038581159879
AO-13
1 19216U 88051B 94102.44882608 -.00000591 10000-4 0 9010
2 19216 57.8540 258.2544 7212470 338.9704 2.1469 2.09726746 13130
UO-14
1 20437U 90005B 94102.72595379 0.00000044 34216-4 0 9800
2 20437 98.5909 188.3875 0011861 27.2725 332.9072 14.29836251220236
AO-16
1 20439U 90005D 94102.22422065 0.00000035 30574-4 0 7809
2 20439 98.5999 189.0565 0012191 28.4313 331.7529 14.29890613220173
DO-17
1 20440U 90005E 94102.18498366 0.00000054 37689-4 0 7796
2 20440 98.5997 189.3180 0012323 28.1110 332.0736 14.30029880220185
WO-18
1 20441U 90005F 94103.20868419 0.00000027 27434-4 0 7811
2 20441 98.6004 190.3356 0012767 26.3552 333.8277 14.30004741220330
LO-19
1 20442U 90005G 94102.77141414 0.00000065 42093-4 0 7799
```

```
2 20442 98.6011 190.1446 0013248 26.1774 334.0074 14.30100099220281
FO-20
1 20480U 90013C 94097.96669648 -.00000006 52518-4 0 6741
2 20480 99.0290 263.0912 0541461 138.5003 225.8553 12.83224980195126
AO-21
1 21087U 91006A 94103.24778531 0.00000093 82657-4 0 4536
2 21087 82.9451 190.7595 0033903 265.5771 94.1509 13.74537687160664
UO-22
1 21575U 91050B 94105.18696717 0.00000099 47940-4 0 4821
2 21575 98.4391 180.9472 0008536 113.8412 246.3672 14.36907331144038
KO-23
1 22077U 92052B 94101.99590421 -.00000037 10000-3 0 3763
2 22077 66.0840 58.5659 0012448 304.1572 55.8265 12.86285353 78271
KO-25
1 22830U 93061H 94098.16232175 0.00000083 50860-4 0 2795
2 22830 98.5601 172.6843 0012451 25.4816 334.6987 14.28045473 27700
IO-26
1 22826U 93061D 94103.67236218 0.00000059 41781-4 0 2778
2 22826 98.6582 180.1464 0010144 41.2739 318.9209 14.27721247 28481
AO-27
1 22825U 93061C 94103.75676341 0.00000039 33835-4 0 2770
2 22825 98.6585 180.2028 0009625 39.3913 320.7961 14.27617999 28499
PO-28
1 22829U 93061G 94102.72059002 0.00000040 33685-4 0 2707
2 22829 98.6544 179.2203 0010938 32.2906 327.8933 14.28017457 28350
STS-59
1 23042U 94020A 94105.25000000 0.00021265 11104-4 10206-4 0 229
2 23042 56.9919 235.9631 0007572 284.1210 37.4442 16.22555238 935
Mir
1 16609U 86017A 94104.80609580 0.00006708 91817-4 0 5668
2 16609 51.6466 143.8890 0015448 142.9508 217.2549 15.58638827466139

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
April 19, 1994, at 2230z on Baudot and AMTOR.
NNNN
--
Marc Grant Pager : 214-246-1150
home: marcbg@netcom.com work: marcbg@esy.com Amateur Radio N5MEI
```

604. 48-Hours & Unidentified radio signals.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-21 22:46:34 UTC
From: fsrla@aurora.alaska.edu
Message-ID: <1994Apr21.144634.1@aurora.alaska.edu>
Source record: 27908

This is probably the wrong news group to post this in.
If so, redirect me, please!!!!

Anyway, the show 48 Hours last night broadcast about
the search for UFO's. I found most of it rather hokey,
and (in all honesty) rather humorous.

What got my attention, however, was the segment on the
radio-telescope facility that was scanning the skies in
search of hopeful radio contact, or sounds, or, well,
anything out of the norm. They had 37 signals they
could not identify.

Now, my question is, does anybody know what frequencies
these 37 signals were heard on? I'm just curious.

Please e-mail me at FSRLA@aurora.alaska.edu
Thanks!

605. Yaesu FT-736R/AEA DSP-1232 interface problem

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 03:40:45 UTC
From: rdhoughton@vms4.sci.csupomona.edu
Message-ID: <1994Apr21.204045.1@clstcs>
Source record: 27909

I'm in the process of connecting a Yaesu FT-736R transceiver to an AEA DSP-1232 all mode controller with the intention of working PACSAT. I have the new version 7.00 firmware which supports modem 13 doppler correction for the radio. Unfortunately, if I'm reading the schematics properly, the AEA unit seems to expect that the up/down frequency buttons on the microphone operate by pulling a line to ground, while these buttons on the FT-736R seem to function by pulling a line to +5 volts in order to step the frequency up or down. Needless to say, that after following the AEA instructions (and resultantly pulling the +5 power supply to ground) my radio was not a happy camper. Luckily I got away without damage but I've decided to ask for help. There must be a lot of people out there who have run into this problem. The AEA rep was courteous but had no real answers. (I guess you'll have to build some kind of interface...)

If any of you have a simple solution to this problem, I'd love to hear from you.

Thanks for your help!

Bob Houghton, KC6LVG
rdhoughton@vms4.csupomona.edu

606. Building a Satellite. Need Advice.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 06:44:19 UTC
From: rbatra@leland.Stanford.EDU
Message-ID: <2p7ro3$iok@nntp2.Stanford.EDU>
Source record: 27787
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.digital.misc

Hi All,

I'm a Stanford graduate student in the Aeronautics program and
am building a satellite that will be launched hopefully sometime next year.
I plan on using a TNC for telemetry data. Since the majority of the
satellites use PSK, I plan on using a rad hard version of a paccom tiny 2.
I hear they use low power (CMOS) and are easy to hook up to a transceiver
(as opposed to 9600). First, are my decisions sound?
The satellite will be in LEO, and we do plan on downloading jpeg pics
(about 20K each). 8 - 15 minute windows.
Second, what can I do about data integrity? I hear there is a
protocol called pacsat that the uosat's use- is this an easily configured
code (we plan on launching a 68332), and if so where is it available.
If there is a better/easier protocol available let me know. My major concern
is to resume a download if the window is not long enough to retrieve a
picture.
Third, using a store bought TNC 1200 baud, will I have any problems
uploading. Will Doppler's effect be a problem?

Thanks in advance,

Rajesh Batra
rbatra@leland.stanford.edu

607. Re: Building a Satellite. Need Advice.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 12:51:07 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <rlong-220494084918@slip2-40.acs.ohio-state.edu>
Source record: 27773

In article <2p7ro3$iok@nntp2.Stanford.EDU>, rbatra@leland.Stanford.EDU
(Rajesh Kumar Batra) wrote:

> Hi All,
>
>
> I'm a Stanford graduate student in the Aeronautics program and
> am building a satellite that will be launched hopefully sometime next year.
> I plan on using a TNC for telemetry data. Since the majority of the
> satellites use PSK, I plan on using a rad hard version of a paccom tiny 2.
> I hear they use low power (CMOS) and are easy to hook up to a transceiver
> (as opposed to 9600). First, are my decisions sound?
> The satellite will be in LEO, and we do plan on downloading jpeg pics
> (about 20K each). 8 - 15 minute windows.
> Second, what can I do about data integrity? I hear there is a
> protocol called pacsat that the uosat's use- is this an easily configured
> code (we plan on launching a 68332), and if so where is it available.
> If there is a better/easier protocol available let me know. My major concern
> is to resume a download if the window is not long enough to retrieve a
> picture.
> Third, using a store bought TNC 1200 baud, will I have any problems
> uploading. Will Doppler's effect be a problem?
>
> Thanks in advance,
>
> Rajesh Batra
> rbatra@leland.stanford.edu

You did not mention anything about frequencies. You can not use
amateur radio frequencies just because you have a license! There are
licensing procedures etc.

Ron w8gus.

608. ORBS$112.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 13:42:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-112.o.1994@ampr.org>
Source record: 27910
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-112.O
Orbital Elements 112.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX April 22, 1994
BID: $ORBS-112.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94105.57495596
Element set: 274
Inclination: 27.1808 deg
RA of node: 332.1525 deg
Eccentricity: 0.6020888
Arg of perigee: 170.5875 deg
Mean anomaly: 209.8109 deg
Mean motion: 2.05879133 rev/day
_FDW;yQ(&4-vYokAhO`Y:sYl>9D>-
zoWazC2@A>K*-I3Vy7w}&7`&)tJ})S+7^)G7W3SL+$Ee%QRY
```

609. ORBS$112.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 14:10:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-112.d.1994@ampr.org>
Source record: 27761
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-112.D
Orbital Elements 112.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX April 22, 1994
BID: $ORBS-112.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94107.20453956
Element set: 981
Inclination: 98.5908 deg
RA of node: 192.8056 deg
Eccentricity: 0.0011724
Arg of perigee: 14.4884 deg
Mean anomaly: 345.6638 deg
Mean motion: 14.29837049 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 22087
Checksum: 326

Satellite: AO-16
Catalog number: 20439
Epoch time: 94111.18104805
Element set: 782
Inclination: 98.5996 deg
RA of node: 197.9018 deg
Eccentricity: 0.0011731
Arg of perigee: 3.2480 deg
Mean anomaly: 356.8778 deg
Mean motion: 14.29891814 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 22145
Checksum: 320

Satellite: DO-17
Catalog number: 20440
Epoch time: 94110.72112935
Element set: 781
Inclination: 98.5998 deg
RA of node: 197.7505 deg
Eccentricity: 0.0011875
Arg of perigee: 4.5921 deg
```

Mean anomaly: 355.5369 deg
Mean motion: 14.30031331 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 22140
Checksum: 288

Satellite: WO-18
Catalog number: 20441
Epoch time: 94107.26692366
Element set: 782
Inclination: 98.6004 deg
RA of node: 194.3449 deg
Eccentricity: 0.0012684
Arg of perigee: 14.5403 deg
Mean anomaly: 345.6140 deg
Mean motion: 14.30005376 rev/day
Decay rate: 3.1e-07 rev/day^2
Epoch rev: 22091
Checksum: 278

Satellite: LO-19
Catalog number: 20442
Epoch time: 94107.24917380
Element set: 780
Inclination: 98.6010 deg
RA of node: 194.5689 deg
Eccentricity: 0.0013020
Arg of perigee: 14.0065 deg
Mean anomaly: 346.1473 deg
Mean motion: 14.30100632 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 22092
Checksum: 263

Satellite: UO-22
Catalog number: 21575
Epoch time: 94109.22574452
Element set: 483
Inclination: 98.4387 deg
RA of node: 184.9054 deg
Eccentricity: 0.0008544
Arg of perigee: 102.1158 deg
Mean anomaly: 258.0983 deg
Mean motion: 14.36908131 rev/day
Decay rate: 7.3e-07 rev/day^2
Epoch rev: 14461
Checksum: 310

Satellite: KO-23
Catalog number: 22077
Epoch time: 94110.23751688

Element set: 378
Inclination: 66.0880 deg
RA of node: 41.3145 deg
Eccentricity: 0.0012900
Arg of perigee: 301.7999 deg
Mean anomaly: 58.1768 deg
Mean motion: 12.86285337 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 7933
Checksum: 316

Satellite: AO-27
Catalog number: 22825
Epoch time: 94108.17221452
Element set: 278
Inclination: 98.6579 deg
RA of node: 184.5746 deg
Eccentricity: 0.0009432
Arg of perigee: 28.6059 deg
Mean anomaly: 331.5642 deg
Mean motion: 14.27618366 rev/day
Decay rate: 2.0e-07 rev/day^2
Epoch rev: 2912
Checksum: 313

Satellite: IO-26
Catalog number: 22826
Epoch time: 94107.73708649
Element set: 278
Inclination: 98.6576 deg
RA of node: 184.1717 deg
Eccentricity: 0.0009992
Arg of perigee: 30.9978 deg
Mean anomaly: 329.1789 deg
Mean motion: 14.27721646 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 2906
Checksum: 361

Satellite: KO-25
Catalog number: 22830
Epoch time: 94110.70406310
Element set: 282
Inclination: 98.5586 deg
RA of node: 184.9727 deg
Eccentricity: 0.0011711
Arg of perigee: 350.4794 deg
Mean anomaly: 9.6158 deg
Mean motion: 14.28047654 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 2949

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Checksum: 306

/EX
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610. ORBS$112.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 14:11:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-112.w.1994@ampr.org>
Source record: 27762
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-112.W
Orbital Elements 112.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX April 22, 1994
BID: $ORBS-112.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94101.00139129
Element set: 779
Inclination: 99.0564 deg
RA of node: 150.6775 deg
Eccentricity: 0.0015918
Arg of perigee: 51.2366 deg
Mean anomaly: 309.0223 deg
Mean motion: 14.13606404 rev/day
Decay rate: 1.24e-06 rev/day^2
Epoch rev: 48085
Checksum: 292

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94108.89085333
Element set: 686
Inclination: 98.5082 deg
RA of node: 119.7012 deg
Eccentricity: 0.0013675
Arg of perigee: 138.3495 deg
Mean anomaly: 221.8729 deg
Mean motion: 14.24879342 rev/day
Decay rate: 1.8e-07 rev/day^2
Epoch rev: 39416
Checksum: 339

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94111.01064387
Element set: 280
Inclination: 82.5405 deg
RA of node: 314.0754 deg
Eccentricity: 0.0016786
Arg of perigee: 347.5650 deg
```

Mean anomaly: 12.5094 deg
Mean motion: 13.84713913 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 31444
Checksum: 286

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94110.72808282
Element set: 277
Inclination: 82.5451 deg
RA of node: 4.3488 deg
Eccentricity: 0.0018532
Arg of perigee: 47.7701 deg
Mean anomaly: 312.4996 deg
Mean motion: 13.16966458 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27569
Checksum: 321

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94100.87099016
Element set: 592
Inclination: 99.1690 deg
RA of node: 88.1470 deg
Eccentricity: 0.0011599
Arg of perigee: 328.2207 deg
Mean anomaly: 31.8263 deg
Mean motion: 14.12974927 rev/day
Decay rate: 8.7e-07 rev/day^2
Epoch rev: 28571
Checksum: 320

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94111.19644899
Element set: 279
Inclination: 82.5218 deg
RA of node: 189.3509 deg
Eccentricity: 0.0015717
Arg of perigee: 31.1221 deg
Mean anomaly: 329.0865 deg
Mean motion: 13.84362770 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 25980
Checksum: 335

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94111.24146181

Element set: 28
Inclination: 82.5505 deg
RA of node: 309.3582 deg
Eccentricity: 0.0007696
Arg of perigee: 86.2726 deg
Mean anomaly: 273.9313 deg
Mean motion: 13.04415154 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21547
Checksum: 277

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94109.89761247
Element set: 781
Inclination: 82.5415 deg
RA of node: 254.7566 deg
Eccentricity: 0.0015477
Arg of perigee: 316.2043 deg
Mean anomaly: 43.7885 deg
Mean motion: 13.84189036 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 19255
Checksum: 329

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94110.56820725
Element set: 946
Inclination: 98.8363 deg
RA of node: 132.5398 deg
Eccentricity: 0.0014827
Arg of perigee: 164.2542 deg
Mean anomaly: 195.9085 deg
Mean motion: 14.01315653 rev/day
Decay rate: 1.34e-06 rev/day^2
Epoch rev: 18563
Checksum: 318

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94111.17919044
Element set: 790
Inclination: 82.5277 deg
RA of node: 191.3327 deg
Eccentricity: 0.0012209
Arg of perigee: 203.0180 deg
Mean anomaly: 157.0435 deg
Mean motion: 13.83579168 rev/day
Decay rate: 1.01e-06 rev/day^2
Epoch rev: 17987

Checksum: 294

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94107.29308625
Element set: 687
Inclination: 82.5411 deg
RA of node: 212.6313 deg
Eccentricity: 0.0012918
Arg of perigee: 345.0275 deg
Mean anomaly: 15.0439 deg
Mean motion: 13.16461141 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14334
Checksum: 261

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94106.92507229
Element set: 7
Inclination: 98.6240 deg
RA of node: 136.0374 deg
Eccentricity: 0.0014052
Arg of perigee: 55.2990 deg
Mean anomaly: 304.9508 deg
Mean motion: 14.22392169 rev/day
Decay rate: 1.36e-06 rev/day^2
Epoch rev: 15182
Checksum: 280

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94109.55257500
Element set: 695
Inclination: 82.5554 deg
RA of node: 158.1550 deg
Eccentricity: 0.0013901
Arg of perigee: 350.8311 deg
Mean anomaly: 9.2571 deg
Mean motion: 13.16829738 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 12874
Checksum: 299

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94111.06886170
Element set: 290
Inclination: 82.5460 deg
RA of node: 251.6896 deg
Eccentricity: 0.0023402

```
Arg of perigee: 28.8050 deg
Mean anomaly: 331.4400 deg
Mean motion: 13.83003730 rev/day
Decay rate: 1.6e-07 rev/day^2
Epoch rev: 3219
Checksum: 261

/EX
```

611. ORBS$112.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 14:13:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-112.m.1994@ampr.org>
Source record: 27763
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-112.M
Orbital Elements 112.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX April 22, 1994
BID: $ORBS-112.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94107.20487084
Element set: 271
Inclination: 98.6541 deg
RA of node: 183.6629 deg
Eccentricity: 0.0010797
Arg of perigee: 19.2844 deg
Mean anomaly: 340.8746 deg
Mean motion: 14.28018464 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 2899
Checksum: 322

Satellite: MIR
Catalog number: 16609
Epoch time: 94111.21750077
Element set: 574
Inclination: 51.6453 deg
RA of node: 111.7160 deg
Eccentricity: 0.0015230
Arg of perigee: 167.5089 deg
Mean anomaly: 192.6283 deg
Mean motion: 15.58719614 rev/day
Decay rate: 4.090e-05 rev/day^2
Epoch rev: 46715
Checksum: 293

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94111.23915846
Element set: 469
Inclination: 28.4697 deg
RA of node: 241.7697 deg
Eccentricity: 0.0005819
Arg of perigee: 209.4240 deg
```

Mean anomaly: 150.6019 deg
Mean motion: 14.90578956 rev/day
Decay rate: 6.05e-06 rev/day^2
Epoch rev: 2088
Checksum: 318

Satellite: GRO
Catalog number: 21225
Epoch time: 94109.53006684
Element set: 84
Inclination: 28.4608 deg
RA of node: 279.2647 deg
Eccentricity: 0.0003636
Arg of perigee: 266.8444 deg
Mean anomaly: 93.1785 deg
Mean motion: 15.40645635 rev/day
Decay rate: 3.815e-05 rev/day^2
Epoch rev: 4788
Checksum: 320

Satellite: UARS
Catalog number: 21701
Epoch time: 94111.19757853
Element set: 504
Inclination: 56.9862 deg
RA of node: 27.4374 deg
Eccentricity: 0.0004876
Arg of perigee: 90.7374 deg
Mean anomaly: 269.4218 deg
Mean motion: 14.96394646 rev/day
Decay rate: -1.801e-05 rev/day^2
Epoch rev: 14240
Checksum: 313

/EX

612. ORBS$112.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 14:15:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-112.n.1994@ampr.org>
Source record: 27764
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-112.N
2Line Orbital Elements 112.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX April 22, 1994
BID: $ORBS-112.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94105.57495596 -.00000135 00000-0 10000-3 0 2740
2 14129 27.1808 332.1525 6020888 170.5875 209.8109 2.05879133 81490
UO-11
1 14781U 84021B 94109.04608251 .00000187 00000-0 39526-4 0 6829
2 14781 97.7897 126.5360 0013014 97.3621 262.9075 14.69192084541623
RS-10/11
1 18129U 87054A 94108.21130139 .00000038 00000-0 24654-4 0 8903
2 18129 82.9285 13.1768 0010648 184.3188 175.7885 13.72335054341681
AO-13
1 19216U 88051B 94102.44882608 -.00000591 00000-0 10000-4 0 9011
2 19216 57.8540 258.2544 7212470 338.9704 2.1469 2.09726746 44639
FO-20
1 20480U 90013C 94106.93317526 -.00000013 00000-0 35320-4 0 6767
2 20480 99.0282 270.3543 0541421 118.2022 247.4845 12.83225494196272
AO-21
1 21087U 91006A 94110.16310556 .00000093 00000-0 82657-4 0 4557
2 21087 82.9443 185.6439 0033668 245.5203 114.2440 13.74538249161610
RS-12/13
1 21089U 91007A 94108.30764982 .00000028 00000-0 14478-4 0 6803
2 21089 82.9200 55.8515 0027920 277.6170 82.1811 13.74038670160425
ARSENE
1 22654U 93031B 94110.18598093 -.00000078 00000-0 00000 0 0 2496
2 22654 1.7263 102.2335 2923372 178.7851 185.7394 1.42200998 373
UO-14
1 20437U 90005B 94107.20453956 .00000042 00000-0 33213-4 0 9818
2 20437 98.5908 192.8056 0011724 14.4884 345.6638 14.29837049220873
AO-16
1 20439U 90005D 94111.18104805 .00000026 00000-0 26948-4 0 7826
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2 20439 98.5996 197.9018 0011731 3.2480 356.8778 14.29891814221456
DO-17
1 20440U 90005E 94110.72112935 .00000054 00000-0 38032-4 0 7817
2 20440 98.5998 197.7505 0011875 4.5921 355.5369 14.30031331221401
WO-18
1 20441U 90005F 94107.26692366 .00000031 00000-0 28871-4 0 7820
2 20441 98.6004 194.3449 0012684 14.5403 345.6140 14.30005376220918
LO-19
1 20442U 90005G 94107.24917380 .00000036 00000-0 30935-4 0 7802
2 20442 98.6010 194.5689 0013020 14.0065 346.1473 14.30100632220925
UO-22
1 21575U 91050B 94109.22574452 .00000073 00000-0 39328-4 0 4836
2 21575 98.4387 184.9054 0008544 102.1158 258.0983 14.36908131144618
KO-23
1 22077U 92052B 94110.23751688 -.00000037 00000-0 10000-3 0 3787
2 22077 66.0880 41.3145 0012900 301.7999 58.1768 12.86285337 79338
AO-27
1 22825U 93061C 94108.17221452 .00000020 00000-0 25928-4 0 2786
2 22825 98.6579 184.5746 0009432 28.6059 331.5642 14.27618366 29120
IO-26
1 22826U 93061D 94107.73708649 .00000027 00000-0 28638-4 0 2784
2 22826 98.6576 184.1717 0009992 30.9978 329.1789 14.27721646 29063
KO-25
1 22830U 93061H 94110.70406310 .00000054 00000-0 39012-4 0 2823
2 22830 98.5586 184.9727 0011711 350.4794 9.6158 14.28047654 29493
NOAA-9
1 15427U 84123A 94101.00139129 .00000124 00000-0 89802-4 0 7791
2 15427 99.0564 150.6775 0015918 51.2366 309.0223 14.13606404480855
NOAA-10
1 16969U 86073A 94108.89085333 .00000018 00000-0 25824-4 0 6863
2 16969 98.5082 119.7012 0013675 138.3495 221.8729 14.24879342394169
MET-2/17
1 18820U 88005A 94111.01064387 .00000044 00000-0 25730-4 0 2807
2 18820 82.5405 314.0754 0016786 347.5650 12.5094 13.84713913314444
MET-3/2
1 19336U 88064A 94110.72808282 .00000051 00000-0 10000-3 0 2779
2 19336 82.5451 4.3488 0018532 47.7701 312.4996 13.16966458275693
NOAA-11
1 19531U 88089A 94100.87099016 .00000087 00000-0 71741-4 0 5924
2 19531 99.1690 88.1470 0011599 328.2207 31.8263 14.12974927285714
MET-2/18
1 19851U 89018A 94111.19644899 .00000069 00000-0 48393-4 0 2793
2 19851 82.5218 189.3509 0015717 31.1221 329.0865 13.84362770259806
MET-3/3
1 20305U 89086A 94111.24146181 .00000044 00000-0 10000-3 0 289
2 20305 82.5505 309.3582 0007696 86.2726 273.9313 13.04415154215471
MET-2/19
1 20670U 90057A 94109.89761247 .00000023 00000-0 79036-5 0 7817
2 20670 82.5415 254.7566 0015477 316.2043 43.7885 13.84189036192550
FY-1/2
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1 20788U 90081A 94110.56820725 .00000134 00000-0 11727-3 0 9464
2 20788 98.8363 132.5398 0014827 164.2542 195.9085 14.01315653185630
MET-2/20
1 20826U 90086A 94111.17919044 .00000101 00000-0 78493-4 0 7908
2 20826 82.5277 191.3327 0012209 203.0180 157.0435 13.83579168179873
MET-3/4
1 21232U 91030A 94107.29308625 .00000050 00000-0 10000-3 0 6872
2 21232 82.5411 212.6313 0012918 345.0275 15.0439 13.16461141143343
NOAA-12
1 21263U 91032A 94106.92507229 .00000136 00000-0 80237-4 0 79
2 21263 98.6240 136.0374 0014052 55.2990 304.9508 14.22392169151826
MET-3/5
1 21655U 91056A 94109.55257500 .00000051 00000-0 10000-3 0 6955
2 21655 82.5554 158.1550 0013901 350.8311 9.2571 13.16829738128744
MET-2/21
1 22782U 93055A 94111.06886170 .00000016 00000-0 10562-5 0 2905
2 22782 82.5460 251.6896 0023402 28.8050 331.4400 13.83003730 32197
POSAT
1 22829U 93061G 94107.20487084 .00000052 00000-0 38620-4 0 2719
2 22829 98.6541 183.6629 0010797 19.2844 340.8746 14.28018464 28993
MIR
1 16609U 86017A 94111.21750077 .00004090 00000-0 58434-4 0 5749
2 16609 51.6453 111.7160 0015230 167.5089 192.6283 15.58719614467153
HUBBLE
1 20580U 90037B 94111.23915846 .00000605 00000-0 45213-4 0 4690
2 20580 28.4697 241.7697 0005819 209.4240 150.6019 14.90578956 20887
GRO
1 21225U 91027B 94109.53006684 .00003815 00000-0 84563-4 0 848
2 21225 28.4608 279.2647 0003636 266.8444 93.1785 15.40645635 47880
UARS
1 21701U 91063B 94111.19757853 -.00001801 00000-0 -13661-3 0 5045
2 21701 56.9862 27.4374 0004876 90.7374 269.4218 14.96394646142406
/EX
```

613. Looking for the Satelite FAQ

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 15:09:15 UTC
From: dparker@netcom.com
Message-ID: <dparkerCoo23F.Fr6@netcom.com>
Source record: 27765

Well I read it, loved it, then did not save it. Now I cannot find it.
Would some kind person e-mail it to me?
Great information!
Many thanks in advance,
Dave

****
* Dave Parker: e-mail: dparker@netcom.com *
* Tracy, California USA *
****

614. Re: Yaesu FT-736R/AEA DSP-1232 interface problem

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 15:33:45 UTC
From: kinzer@dtsdev0.sps.mot.com
Message-ID: <1994Apr22.153345.2024@newsgate.sps.mot.com>
Source record: 27766

In article <1994Apr21.204045.1@clstcs> rdhoughton@vms4.sci.csupomona.edu writes:
>AEA unit seems to expect that the up/down frequency buttons
>on the microphone operate by pulling a line to ground, while
>these buttons on the FT-736R seem to function by pulling a
>line to +5 volts in order to step the frequency up or down.

Looks like a job for a couple of general purpose PNP transistors.
Emitters to +5v, bases through current limiting resistors to the
modem control wires, and collectors to the radio control wires.
Presto! A simple inversion.

-dave

615. Re: 48-Hours & Unidentified radio signals.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 17:55:32 UTC
From: palmer@alumni.caltech.edu
Message-ID: <2p932k$ajn@gap.cco.caltech.edu>
Source record: 27767

fsrla@aurora.alaska.edu writes:

>This is probably the wrong news group to post this in.
>If so, redirect me, please!!!!

>Anyway, the show 48 Hours last night broadcast about
>the search for UFO's. I found most of it rather hokey,
>and (in all honesty) rather humorous.

>What got my attention, however, was the segment on the
>radio-telescope facility that was scanning the skies in
>search of hopeful radio contact, or sounds, or, well,
>anything out of the norm. They had 37 signals they
>could not identify.

>Now, my question is, does anybody know what frequencies
>these 37 signals were heard on? I'm just curious.

>Please e-mail me at FSRLA@aurora.alaska.edu
>Thanks!

Horowitz and Sagan, 1993 Sept 20, Astrophysical Journal V. 415, 218-235.

The frequencies were near 1420 and 2840 MHz. (Near the 21 cm line of Hydrogen
and its second harmonic.)

--
David M. Palmer palmer@alumni.caltech.edu

616. rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 18:57:58 UTC
From: dragonsl@hebron.connected.com
Message-ID: <2p96nm$7k6@hebron.connected.com>
Source record: 27768
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy

rec.radio.amateur.vhf.plus should it be created?

This is a informal request to see if there is enough interest to warrant a new news group. The driving factors in this interest are, the apparent demise of the vhf list run out of Stanford University and the lack of any other news group for this area. The major unknown is if there is enough interest to set up a formal RFD/CFV for this area.

While my primary interest is in the weak signal area, I have also noticed a general need in areas of ATV, Repeaters, FM, etc. So I envision the charter as being read very broadly, to include all areas of VHF/UHF/SHF interest, except RC, satellite, and packet (as they have their own forums)

Please reply to me via email or to rec.radio.amateur.misc (also posted to rec.radio.amateur.space and rec.radio.amateur.policy)

Ralph Lindberg N7BSN member ARRL, AMSAT,CS-VHF,MW-Microwave, Kistap ARES
email =>dragonsl@hebron.connected.com

617. Re: STS-60 QSL?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 19:07:16 UTC
From: dparker@netcom.com
Message-ID: <dparkerCooD44.BwD@netcom.com>
Source record: 27769

Greg (laborde@elm.jpl.nasa.gov) wrote:
: Has anyone received an STS-60 QSL yet?

Still waiting.....

Dave

KD6RRS, Tracy Ca., USA
Dave Parker

618. Re: AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 20:18:02 UTC
From: wa4ymz@aol.com
Message-ID: <2p9bdq$l65@search01.news.aol.com>
Source record: 27770

In article <766339135snz@g8sjp.demon.co.uk>, ip@g8sjp.demon.co.uk (Iain Philipps) writes:

OSCAR-21 uplink? From all the info I have, the uplink is 435.016, although 435.015 seems to work well.

Hope this helps.

73, Gary WA4YMZ

619. Satellites without beams

Newsgroup: rec.radio.amateur.space
Date: 1994-04-22 20:27:06 UTC
From: wa4ymz@aol.com
Message-ID: <2p9buq$l9m@search01.news.aol.com>
Source record: 27771

I live in a rented house, and my landlord is pretty reasonable about letting me do some things, but I think he would draw the line at a tower or putting up beams or arrays on the roof. What are my options for satellite work? I don't mind adding hardware in the shack, but the stuff outside will be limited to dipoles, verticals, etc. Present equipment includes HF, 2M, and an old TNC-2 clone. I'll probably be replacing the TNC shortly, but the 2M is an Icom 251A and it will most likely be staying. Upgrading will be piece-by-piece. Suggestions are GREATLY appreciated. TNX.

73, Gary WA4YMZ

620. High Altitude Balloon Flight in Denver Postponed

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 02:36:36 UTC
From: rickvg@cscns.com
Message-ID: <qc8kjSEHGUYZ057yn@cscns.com>
Source record: 27772

Forwarded from Ground Station Ops of EOSS:

The flight of EOSS 16 has been delayed until May 1, 1994.

Due to technical difficulties with the Ozone detection experiment being
conducted by Ranum High School, one week is needed to work out the problems.

All payload frequencies will remain the same.

Here is the updated fact sheet.

FLIGHT PROFILE FOR EOSS 16

LAUNCH DATE : May 1, 1994
LAUNCH SITE: Thunder Ridge Middle School
Picadilly and Smokey Hill Rd.
Aurora, Colorado, USA
LAUNCH SITE COORDINATES: 39.62305 deg North
104.73544 deg West
LAUNCH TIME : 9:00 a.m.
FLIGHT EXPERIMENT: Ozone detection at various levels of the atmosphere
EXPERIMENT CONDUCTED BY: Ranum High School, Longmont Colorado.
PROJECT INTEGRATOR: Andy Kellett/ N0SIS
SECONDARY EXPERIMENT: Testing of the APRS.
(Automatic Position Reporting System)

FREQUENCIES:

Shuttle I:
Telemetry 144.340 MHz
Beacon 147.555
ATV 426.250

HF Net:
7230khz Phone + or - QRM

Foxhunters:
CRA Repeaters 147.225 MHz

PURPOSE OF THE FLIGHT:
There are several experiments that are going to be run on the flight of
EOSS 16.

1. The primary experiment will be the detection of Ozone at various
altitudes above Colorado. This experiment will be conducted by Random
High School. The students are interested in the Ozone concentration and

may do a follow up flight to see if the levels have changed. They will be graphing the results and presenting them to the school science fair.

2. The second experiment will be the use of APRS (Automatic Position Reporting System). The controller will be sending down text strings that will include latitude and longitude in them which should plot the position of the payload on any APRS equipped packet station within the footprint of the balloon as the payload travels the skies of Colorado. The typical footprint extends to ALL neighboring states. So, if you are in southern Wyoming, south western Nebraska, western Kansas, western Oklahoma, northern Texas, parts of New Mexico and Arizona and Eastern Utah, look into tracking the progress of EOSS-16 with APRS. Of interest, noting the difference between Loran-C, which is used on Shuttle I, and GPS, which is used on Shuttle II.

In the Denver Metro Area check on my BBS, N0VSA-1 and find out where to get the APRS program.

From the APRS documentation:

THE LATEST APRS is posted on 410-280-2503 BBS. After version 3.11 I will also always post a file similar to: 400to401.zip which will contain only the files that changed in the lastest release.

Anyone interested is welcome to come to the launch site and experince what a EOSS flight is like. We will have the ground station computer set up and also have TV monitors set up so you can see the flight from the perspective of the payload's onboard B&W tv camera. After the payload has been launched there will plenty of people around to answer any questions that you may have.

Hope to see you there!!
Brian
N0VSA@W0GVT#NECO.CO.NOAM
brian.thomas@filebank.com

73 -- Rick

****
* Rick von Glahn Edge of Space Sciences, Inc. *
* rickvg@cscns.com - Internet (preferred) Promoting Science and Education *
* 74620,637 - Compuserve through Amateur Radio and *
* N0KKZ@W0GVT.#NECO.CO.USA - packet radio High Altitude Balloons *
****

621. Re: rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 17:19:16 UTC
From: jhanson@yar.cs.wisc.edu
Message-ID: <2pblak$oj9@spool.cs.wisc.edu>
Source record: 27774
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy

Ralph Lindberg <dragonsl@hebron.connected.com> wrote:
> rec.radio.amateur.vhf.plus should it be created?

While I don't really know if there is enough interest, I would probably subscribe to it. Two suggestions though-

1) Rename to rec.radio.amateur.vhf-plus You will find this a lot more acceptable to sysadmins as it prevents another "layer" from being created. Further, it makes more sense from a hierarchical perspective.

2) Try starting up an alt.radio.amateur.vhf-plus first and see how it does, this requires no votes, etc. and will tell you whether or not support is there for a group in the "real" usenet. (I can probably help with this if you need it.)

Anyway, those are just a couple suggestions.
--
Jason J. Hanson | 1510 Tripp Circle #VI309 | (608) 264-1079
Univ. of Wisconsin | Madison, WI 53706-1294 | Ham: N9LEA (Extra)
-- jhanson@yar.cs.wisc.edu =*+++*= n9lea@k9iu.#sin.in.usa.na --

622. Re: rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 19:49:09 UTC
From: paulf@abercrombie.Stanford.EDU
Message-ID: <paulf.767130549@abercrombie.Stanford.EDU>
Source record: 27783
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy

dragonsl@hebron.connected.com (Ralph Lindberg) writes:

>This is a informal request to see if there is enough interest to warrant a
>new news group. The driving factors in this interest are, the apparent
>demise of the vhf list run out of Stanford University and the lack of any
>other news group for this area. The major unknown is if there is enough
>interest to set up a formal RFD/CFV for this area.

Since I (loosely) run the vhf+ mailing list, I figured I'd better comment
here.

I started the list about two years ago, maintaining it by hand instead of
setting up some sort of automated listserver. This had both good and bad
consequences; I was able to exercise some judgement over what went over
the list, but I don't have enough free time these days to maintain it.
Part of the problem was that most of the list requests I received indicated
an interest in FM and Repeaters, which is *not* within the scope of the list.

I've considered starting an RFD for a newsgroup from time to time, but given
the fairly low level of traffic on the list (which has a fairly high signal
to noise ratio) I'm not sure this is desirable. Sooo...

I'll see if I can come up with some sort of automated listserver this
weekend, and set it up. If folks really want to set up a newsgroup, that's
okay too; I probably won't tie the two together.

--
-=Paul Flaherty, N9FZX | "Just name a hero, and I'll prove he's a bum."
->paulf@Stanford.EDU | -- Col. Gregory "Pappy" Boyington

623. Orbit DETERMINATION software ??

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 20:18:31 UTC
From: zvikal@ccsg.tau.ac.il
Message-ID: <1994Apr23.201831.2532@aristo.tau.ac.il>
Source record: 27775

Hi all. In recent weeks I have searched many ftp sites for orbit determination software - that is, software for calculating the orbit parameters of the sattelite given data such as measured Ra and Dec from a given ground stations(s), or doppler (i.e. velocity) readings from such stations. While there are many excellent shareware packages available for orbit calculation or tracking (that is, given the orbital parameters where will the sat be at time T), I have failed to find any for my 'Inverse' problem. Any info will be of help.

Thanks,
Zvi
email: zvikal@ccsg.tau.ac.il

624. Re: rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 20:45:28 UTC
From: rwilkins@ccnet.com
Message-ID: <2pc1d8$qmk@ccnet.ccnet.com>
Source record: 27776
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy

Paul Flaherty (paulf@abercrombie.Stanford.EDU) wrote:

: I'll see if I can come up with some sort of automated listserver this
: weekend, and set it up. If folks really want to set up a newsgroup, that's
: okay too; I probably won't tie the two together.

Please post to the newsgroups when you get this going. Thanks

--
Bob Wilkins work bwilkins@cave.org
Berkeley, California home rwilkins@ccnet.com
94701-0710 play n6fri@n6eeg.#nocal.ca.usa.noam

625. Navstar GPS Constellation Status (94-04-23)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 21:56:31 UTC
From: lang@unb.ca
Message-ID: <ID4351.D940423.T185350.lang@unb.ca>
Source record: 27784
Cross-posted to:
comp.infosystems.gis,rec.aviation.misc,rec.boats,rec.radio.amateur.space,sci.electronics,sci.geo.satellite-nav,sci.space.news

```
Navstar GPS Constellation Status
(94-04-23)

Blk NASA Orbit Launch
II PRN Internat. Catalog Plane Date
Seq SVN Code ID Number Pos'n (UT) Clock Available/Decommissioned
-------------------------------------------------------------------------------
Block I
01 04 1978-020A 10684 78-02-22 78-03-29 85-07-17
02 07 1978-047A 10893 78-05-13 78-07-14 81-07-16
03 06 1978-093A 11054 78-10-06 78-11-13 92-05-18
04 08 1978-112A 11141 78-12-10 79-01-08 89-10-14
05 05 1980-011A 11690 80-02-09 80-02-27 83-11-28
06 09 1980-032A 11783 80-04-26 80-05-16 91-03-06
07 81-12-18 Launch failure
08 11 1983-072A 14189 83-07-14 83-08-10 93-05-04
09 13 1984-059A 15039 C-1 84-06-13 Rb 84-07-19
10 12 1984-097A 15271 A-1 84-09-08 Rb 84-10-03
11 03 1985-093A 16129 85-10-09 85-10-30 94-04-13

Block II
II-1 14 14 1989-013A 19802 E-1 89-02-14 Cs 89-04-15 05:02 UT
II-2 13 02 1989-044A 20061 B-3 89-06-10 Cs 89-08-10 20:46 UT
II-3 16 16 1989-064A 20185 E-3 89-08-18 Cs 89-10-14 20:21 UT
II-4 19 19 1989-085A 20302 A-4 89-10-21 Cs 89-11-23 03:13 UT
II-5 17 17 1989-097A 20361 D-3 89-12-11 Cs 90-01-06 03:30 UT
II-6 18 18 1990-008A 20452 F-3 90-01-24 Cs 90-02-14 22:26 UT
II-7 20 20 1990-025A 20533 B-2 90-03-26 Cs 90-04-18 23:13 UT
II-8 21 21 1990-068A 20724 E-2 90-08-02 Cs 90-08-22 15:00 UT
II-9 15 15 1990-088A 20830 D-2 90-10-01 Cs 90-10-15 00:39 UT

Block IIA
II-10 23 23 1990-103A 20959 E-4 90-11-26 Cs 90-12-10 23:45 UT
II-11 24 24 1991-047A 21552 D-1 91-07-04 Rb 91-08-30 04:44 UT
II-12 25 25 1992-009A 21890 A-2 92-02-23 Cs 92-03-24 11:00 UT
II-13 28 28 1992-019A 21930 C-2 92-04-10 Cs 92-04-25 20:32 UT
II-14 26 26 1992-039A 22014 F-2 92-07-07 Cs 92-07-23 19:43 UT
II-15 27 27 1992-058A 22108 A-3 92-09-09 Cs 92-09-30 20:08 UT
II-16 32 01 1992-079A 22231 F-1 92-11-22 Cs 92-12-11 14:49 UT
II-17 29 29 1992-089A 22275 F-4 92-12-18 Cs 93-01-05 16:39 UT
II-18 22 22 1993-007A 22446 B-1 93-02-03 Cs 93-04-04 05:20 UT
II-19 31 31 1993-017A 22581 C-3 93-03-30 Cs 93-04-13 20:53 UT
II-20 37 07 1993-032A 22657 C-4 93-05-13 Cs 93-06-12 16:15 UT
```

II-21 39 09 1993-042A 22700 A-1 93-06-26 Cs 93-07-20 12:54 UT
II-22 35 05 1993-054A 22779 B-4 93-08-30 Cs 93-09-28 19:29 UT
II-23 34 04 1993-068A 22877 D-4 93-10-26 Cs 93-11-22 18:20 UT
II-24 36 06 1994-016A 23027 C-1 94-03-10 Rb 94-03-28 14:20 UT
38 To be launched on need in FY '94
33 To be launched on need in FY '94
40 To be launched on need in FY '95
30 To be launched on need in FY '95

Notes
1. NASA Catalog Number is also known as NORAD or U.S. Space Command object number.
2. No orbital plane position = satellite no longer operational.
3. Clock: Rb = Rubidium; Cs = Cesium
4. S/A had been enabled on Block II satellites during part of 1990; S/A off between about 10 August 1990 and 1 July 1991 due to Gulf crisis; standard level re-implemented on 15 November 1991. Currently, PRN15 and PRN20 appear to have little or no S/A imposed.
5. Anti-spoofing was activated on 94-01-31 at 00:00 UT on all Block II satellites. (ref. NANU 050-94042)
6. PRN number of SVN32 was changed from 32 to 01 on 93-01-28.
7. PRN03 was set unhealthy on 94-02-27 at 03:20 UT. It was unusable beginning at 02:33 UT on 94-02-27 and remained so until set permanently unusable on 94-04-13 beginning at 15:00 UT due to navigation payload shut down. (ref. NANU 083-94059 and NANU 129-94104)
8. The decommissioning date for PRN06/SVN03 is the date of termination of operations of this satellite (ref. USNO) and is about 3 weeks later than the date GPSIC gives for "deactivation".
9. The PRN06/SVN36 launch included the SEDS-2 tether experiment on the Delta II rocket body (object 23028, 1994-016B). The tether was broken by an impact on 94-03-15. The SEDS-2 end mass subsatellite and about half of the tether re-entered within a few orbits. About 11 km of tether remains attached to the Delta rocket which is still in orbit. (ref. Jonathan McDowell)
10. PRN13 was set unhealthy on 94-02-27 at 13:02 UT and will remain unusable until further notice due to "end of life testing." (ref. NANU 083-94059 and USNO). It is unlikely that PRN13 will return to service. (ref. USNO)
11. The degraded C/A-code performance of PRN19 was corrected effective 94-01-04 at 00:00 UT. (ref. NANU 343-93294, NANU 396-93337, and NANU 006-94010) The correction involved a switch to redundant systems on the satellite. (ref. Aviation Week & Space Technology)

==========
Richard B. Langley Internet: LANG@UNB.CA or SE@UNB.CA
Geodetic Research Laboratory BITnet: LANG@UNB or SE@UNB
Dept. of Geodesy and Geomatics Engineering Phone: (506) 453-5142
University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
==========

626. Re: Satellites without beams

Newsgroup: rec.radio.amateur.space
Date: 1994-04-23 23:41:22 UTC
From: prvalko@vela.acs.oakland.edu
Message-ID: <2pcbn2$58e@oak.oakland.edu>
Source record: 27777

I routinely access RS-10/11 with 10W and a Diamond X-200 vertical.

29MHz rcv is a dipole.

73 =paul= wb8zjl

627. Re: rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-24 05:13:04 UTC
From: paulf@abercrombie.Stanford.EDU
Message-ID: <paulf.767164384@abercrombie.Stanford.EDU>
Source record: 27781
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy

rwilkins@ccnet.com (Bob Wilkins n6fri) writes:

>Paul Flaherty (paulf@abercrombie.Stanford.EDU) wrote:

>: I'll see if I can come up with some sort of automated listserver this
>: weekend, and set it up. If folks really want to set up a newsgroup, that's
>: okay too; I probably won't tie the two together.

>Please post to the newsgroups when you get this going. Thanks

It's done and working. LISTSERV requests should go to:

vhf-request@w6yx.stanford.edu

--
-=Paul Flaherty, N9FZX | "The National Anthem has become The Whine."
->paulf@Stanford.EDU | -- Charles Sykes, _A Nation of Victims_

628. Re: rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-24 15:06:43 UTC
From: dragonsl@hebron.connected.com
Message-ID: <2pe1u3$k1n@hebron.connected.com>
Source record: 27782
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy

Since the VHF list out of Stanford is now up as a LISTSERV consider this
a dead issue IMHO...I'm not going to do anthing else with it

Ralph Lindberg N7BSN

629. ANS-113 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-04-25 01:33:25 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-113.01.1994@ampr.org>
Source record: 27785
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-113.01
WD0E ATTENDS JAMSAT SYMPOSIUM

HR AMSAT NEWS SERVICE BULLETIN 113.01 FROM AMSAT HQ
SILVER SPRING, MD APRIL 24, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-113.01

WD0E Attends JAMSAT Symposium

Jim White (WD0E) reports the annual JAMSAT Symposium was held in Tokyo on 27-MAR-94. Jim attended representing AMSAT-NA and presented a paper on MICROSAT construction and operation, the Deep Space Exploration Society (DSES) radio telescope project at Table Mountain near Boulder, CO, and the high altitude balloon experiments of the Edge of Space Sciences (EOSS) group. The day long symposium included presentations on the construction and use of quadrifiler helices, a version of the MICROSAT ground station software implemented in Japanese, and several presentations regarding Phase-3D. One of the Phase-3D presentations included a live demonstration of the prototype camera and electronics for the SCOPE project that will provide imaging capability aboard the satellite. Jim reports he was particularly impressed by the progress on SCOPE and the demonstration of the capabilities of the camera and electronics. Presenters included JA2PKI, JR1SWB, JM3MAJ, JA0FKM and JH7CKF. An award was presented to Sumio Nakane (JH3BJN) for achieving satellite DXCC using only a four element antenna for 2M, a most impressive accomplishment.

The evening prior to the Symposium, JAMSAT held a celebration of their 20th anniversary. Jim reports the hospitality was outstanding with great international camaraderie and a good deal of discussion about satellite construction and operation. Jim said he was particularly grateful for the hospitality and translation services of Sumio Nakane, Miki Nakayama, and Tak Okamoto.

AMSAT-NA congratulates JAMSAT on its 20th anniversary!

[The AMSAT News Service (ANS) would like to thank WD0E for this bulletin item. WD0E can be reached at his INTERNET address of wd0e@amsat.org.]

/EX
SB SAT @ AMSAT $ANS-113.02
UNAMSAT STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 113.02 FROM AMSAT HQ
SILVER SPRING, MD APRIL 24, 1994
TO ALL RADIO AMATEURS BT

BID: $ANS-113.02

UNAMSAT Status Report

David Liberman (XE1TU) project manager for UNAMSAT at the Autonomous University of Mexico, is resting at home recovering from hepatitis. Meanwhile according to Hector Sosa, chief software engineer for UNAMSAT, the entire student group that has been working on the construction project of their UNAMSAT-1 MICROSAT for about two years, recently obtained their ham tickets after they all took the exam for their amateur radio licenses and have now received their call-signs. The new licensees are:

Jose Garcia XE0IKQ
Juan Zavala XE0MMF
Hector Rojas XE0LFD
Gabriel Garcia Gama XE0JMC
Saul de la Rosa Nieves XE0RAI
Eloy Martinez XE0IKZ
Carlos Wallenius XE0JPM

Those who might want to wish XE1TU a speedy recover may send cards to:

David Liberman (XE1TU)
Bosque de Sayula #22
La Herradura, Estado de Mexico
C.P. 05278
Mexico

[The AMSAT News Service would like to thank WD0E for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-113.03
AMSAT-UK CALL FOR PAPERS

HR AMSAT NEWS SERVICE BULLETIN 113.03 FROM AMSAT HQ
SILVER SPRING, MD APRIL 24, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-113.03

AMSAT-UK Colloquim Call For Papers

The ninth AMSAT-UK Colloquium will be held July 28-31 at the University of Surrey in Guildford, Surrey, England. This year's colloquium will be divided into four primary topic areas: spacecraft engineering, future space missions, groundstation and spacecraft operations and associated amateur space activities. Papers falling into these categories are sought for the event. Authors should submit abstracts to arrive no later than May 10, 1994 for consideration for this year's event with full paper submissions due by June 10, 1994. Authors will be notified of paper acceptance by June 1. Abstracts should be sent to:

Doug Loughmiller, G0SYX
AMSAT-UK Colloquium Programme Chairman
University of Surrey
Centre for Satellite Engineering Research

Guildford, Surrey
GU2 5XH
England

Submissions can also be made to the program chairman via fax on +44 0483 259503 or via the Internet to: D.loughmiller@ee.surrey.ac.uk

Abstracts and papers should only be sent to the addresses listed above.

The annual AMSAT-UK Colloquium is the largest international gathering of amateur satellite enthusiasts and experts in the world and has established a high standard of quality presentations on topics relevant to the amateur satellite community. Organiser's of this year's event would welcome all contributions of program material covering the vast scope of the amateur satellite program as it exists in 1994. The ninth AMSAT-UK Colloquium promises to be the most informative and entertaining event yet. We look forward to your participation in this year's Colloquium. See you in Surrey!

/EX
SB SAT @ AMSAT $ANS-113.04
AO-13 OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 113.04 FROM AMSAT HQ
SILVER SPRING, MD APRIL 24, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-113.04

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS
30-Apr-94 2130 B 176 W9ODI VE2LVC
09-May-94 0000 B 175 W5IU WA5ZIB
14-May-94 1700 B 167 WA5ZIB W5IU
21-May-94 2130 B 185 VE2LVC W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

Slow Scanners are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other SSTV skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-113.05
AMSAT BOOTH AT DAYTON

HR AMSAT NEWS SERVICE BULLETIN 113.05 FROM AMSAT HQ
SILVER SPRING, MD APRIL 24, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-113.05

Look For The AMSAT Booth At The Dayton Hamvention Next Weekend

For those of you who are going to be at Dayton, we look forward to seeing you. The AMSAT booth is in the same spot as last year, 445 - 448.

AMSAT will be holding three sessions during the weekend. On Friday at 1:00 PM in Room 1, "Getting Stated on the Satellites, Including the Packet Birds." This will be moderated by Keith Baker KB1SF. There are two sessions on Saturday, both in Room 5. AT 1:00 PM the SAREX session features several astronauts plus Roy Neal (K6DUE). And at 3:15 PM, learn all about the progress on Phase 3D from Dick Jansson WD4FAB, our VP for Engineering. Dick is working very closely with all the various individuals and groups participating in the construction of the satellite and will bring us up to date on how everything is going.

This being the 10th anniversary of the first "Ham in Space" and the 25th anniversary of the founding of AMSAT, this is a very big year for us. Try to participate in as many of the AMSAT-related functions as you can.

We will be holding an informal dinner and get-together Friday evening. Come by the booth after the Hamvention opens Friday noon and sign up. The restaurant can accommodate only those who sign up.

Communications

The Upper Valley Radio Club in Fairborn has graciously invited us to use their two repeaters while we are in the area. The 2 meter one is on 145.41 (-) and the 70 cm machine is on 442.375 (+). Both are located on a water tower not more than a half mile from the Homewood Suites, where many AMSATers are staying. So, handi-talkies on low power ought to work nicely in that area.

Of course, DARA will run their usual talk-in on 146.94 (-). If you can get through the mob, they do a good job of providing directions.

Around the Hara Arena, and at other locations where we need to communicate :via simplex, AMSAT will use 145.55. I am sure that it won't be clear, but no 2 meter frequency is clear during Hamvention. For those with 70 cm HTs, I suggest 438.00. Mine seems to work there.

I understand from Keith Baker KB1SF, who lives in the Dayton area, that road construction in and around Dayton is particularly troublesome this year. I-75 is reported to be torn up, and down to one lane; BOTH north and south of Needmore Road (the main way to the arena). Also, I-675 north and south are torn up, and down to one lane, in spots. This is the route from I-70 down to the Hoomwood Suites in Fairborn, where most of us will be

staying. So, wherever you're going around Dayton, give yourself plenty of time.

Travel safely and we'll see you next week!

73,

Bill Tynan (W3XO)
AMSAT-NA President

/EX
SB SAT @ AMSAT $ANS-113.06
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 113.06 FROM AMSAT HQ
SILVER SPRING, MD APRIL 24, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-113.06

Weekly OSCAR Status Reports: 23-APR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
20-Apr-94 7:35 -to- 27-Apr-94 7:55 UTC
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

KO-23: Working well. [WH6I]

KO-25: Working well. WH6I reported in last week's KO-25 status report that number of new images can be found on KO-25 but since the wide angle images are in a new format that so far has not been decoded. Well since then he reports that the QUIKDISP.EXE is available on KO-25's BBS for downloading. This is a program that will display the new wide angle views from KO-25. WH6I is in the processing downloading several earth image files. He says that the file KAIW0008 appears to be on the adriatic coast of the former Yugoslavia. [WH6I]

AO-16: Working well. [WH6I]

DO-17: ZR5JRS finds this to be an excellent satellite to monitor as he can receives DOVE with 599 signals when it is at an elevation of

only 7 degrees. To date, however, he has not heard the digital voice. [ZRTJRS]

UO-11: This satellite is working well with clear, readable RTTY. The digital voice also is received well from ZR5JRS's QTH. ZR5JRS observes that he has to wait until UO-11 is at lest 25 degrees above the horizon for him to receive a good copy on UO-11. He notes that this is in contrast to the other OSCAR satellites which he copies almost immediately after they rise above his horizon. His only theory about this is that perhaps UO-11 runs considerably less power than the other OSCARs. [ZR5JRS]

MIR: Over the last 4 days, the MIR BBS has been switched off. This is possibly to prevent clashes with the STS-59 SAREX mission. However, before this, it was relatively easy to access the MIR BBS even using 2 watts of power at an elevation of 18 degrees with a "Slim Jim" antenna. There have been no reports of voice contacts in South Africa that ZS5JRS is aware of over the last 14 months.
[ZR5JRS @ ZR5GQ.NTL.ZAF.AF]

RS-10/11: Of all the OSCAR satellites, this satellite is ZR5JRS's favorite one to work. His station consists of a 10W Yaesu FT-480R with a "Slim Jim" antenna for the uplink, and an old Yaesu FTDX 400 with a long wire antenna for the downlink. From his QTH in Durban, grid square KG59MG, he can work stations in Cape Town, which is about 1300 KM away and stations Johannesburg which is about 500 KM away at the same time for about 3 to 4 minutes. JR5JRS has also found that the downlink is about half as strong as the beacon signal. He also uses the beacon signal to gauge cond-itions on the 10M band, sometimes hearing the beacon up to 10 minutes after the satellite has gone below the horizon!
[ZR5JRS @ ZR5GQ.NTL.ZAF.AF]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

630. Weather Sat freqs.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-25 07:25:24 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <Cot0MD.Hy3@bbc.co.uk>
Source record: 27786

I am trying to put together a list of frequencies for the low orbit
weather satelites. Such as NOAA Meteosat etc. If anyone has freqs please post
them to me and I will compile a 'definitive list' and post it on the net.
It might also be an idea to state what mode (apt or hrpt) is transmitted on
any frequencies listed.

John B

John.boyer@rd.eng.bbc.co.uk

631. APT-Satellites: Report APRIL 23, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-04-25 13:00:26 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-250494130137@129.26.163.240>
Source record: 27778
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, APR 23, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 ON again
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 3-5: APT 137.85 On

NOAA-10 is active again after sufficient separation from
NOAA-12, VHF-conflict ended.
To be complete: Meteor 2-21 and Meteor 3-6 are OFF.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
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632. Re: Orbit DETERMINATION software ??

Newsgroup: rec.radio.amateur.space
Date: 1994-04-25 14:16:38 UTC
From: zlau@arrl.org
Message-ID: <1994Apr25.141638.1184@arrl.org>
Source record: 27779

Methods of Orbit Determination for the Microcomputers
by Dan Boulet ISBN 0-943396-34-4 The Publisher,
Willmen-Bell, Inc., also sells Basic software to go
with the book.

Zvi Lev (zvikal@ccsg.tau.ac.il) wrote:

: Hi all. In recent weeks I have searched many ftp sites for orbit
: determination software - that is, software for calculating the orbit
: parameters of the sattelite given data such as measured Ra and Dec from
: a given ground stations(s), or doppler (i.e. velocity) readings from such
: stations. While there are many excellent shareware packages available for
: orbit calculation or tracking (that is, given the orbital parameters where
: will the sat be at time T), I have failed to find any for my 'Inverse'
: problem. Any info will be of help.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

633. ARLK016 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-04-25 14:18:32 UTC
From: mtracy@arrl.org
Message-ID: <$arlk016.1994@ampr.org>
Source record: 27780
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK016
ARLK016 Keplerian data

ZCZC SK83
QST de W1AW
Keplerian Bulletin 16 ARLK016
From ARRL Headquarters
Newington, CT April 23, 1994
To all radio amateurs

SB KEP ARL ARLK016
ARLK016 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94105.57495596 -.00000135 10000-3 0 2749
2 14129 27.1808 332.1525 6020888 170.5875 209.8109 2.05879133 53523
RS-10/11
1 18129U 87054A 94108.21130139 0.00000038 24654-4 0 8902
2 18129 82.9285 13.1768 0010648 184.3188 175.7885 13.72335054341681
UO-11
1 14781U 84021B 94109.04608251 0.00000187 39526-4 0 6828
2 14781 97.7897 126.5360 0013014 97.3621 262.9075 14.69192084541623
RS-12/13
1 21089U 91007A 94108.30764982 0.00000028 14478-4 0 6802
2 21089 82.9200 55.8515 0027920 277.6170 82.1811 13.74038670160425
AO-13
1 19216U 88051B 94102.44882608 -.00000591 10000-4 0 9010
2 19216 57.8540 258.2544 7212470 338.9704 2.1469 2.09726746 13130
UO-14
1 20437U 90005B 94111.75309930 0.00000068 43403-4 0 9825
2 20437 98.5907 197.2925 0011543 1.7308 358.3908 14.29838189221525
AO-16
1 20439U 90005D 94111.18104805 0.00000026 26948-4 0 7825
2 20439 98.5996 197.9018 0011731 3.2480 356.8778 14.29891814221456
DO-17
1 20440U 90005E 94110.72112935 0.00000054 38032-4 0 7816
2 20440 98.5998 197.7505 0011875 4.5921 355.5369 14.30031331221401
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WO-18
1 20441U 90005F 94111.74497802 0.00000052 37147-4 0 7835
2 20441 98.6000 198.7675 0012534 1.7214 358.4010 14.30006389221559
LO-19
1 20442U 90005G 94111.72692988 0.00000052 37054-4 0 7811
2 20442 98.6010 198.9935 0012845 1.2975 358.8233 14.30101593221561
FO-20
1 20480U 90013C 94111.84518184 -.00000047 -42213-4 0 6773
2 20480 99.0301 274.3363 0541450 107.0911 259.0223 12.83224980196901
AO-21
1 21087U 91006A 94110.16310556 0.00000093 82657-4 0 4556
2 21087 82.9443 185.6439 0033668 245.5203 114.2440 13.74538249161610
UO-22
1 21575U 91050B 94109.22574452 0.00000073 39328-4 0 4835
2 21575 98.4387 184.9054 0008544 102.1158 258.0983 14.36908131144618
KO-23
1 22077U 92052B 94110.23751688 -.00000037 10000-3 0 3786
2 22077 66.0880 41.3145 0012900 301.7999 58.1768 12.86285337 79338
KO-25
1 22830U 93061H 94110.70406310 0.00000054 39012-4 0 2822
2 22830 98.5586 184.9727 0011711 350.4794 9.6158 14.28047654 29493
IO-26
1 22826U 93061D 94112.22229648 0.00000033 31343-4 0 2795
2 22826 98.6575 188.6151 0009827 19.0306 341.1242 14.27722396 29705
AO-27
1 22825U 93061C 94112.23722954 0.00000045 36103-4 0 2795
2 22825 98.6575 188.6003 0009396 17.0892 343.0602 14.27619258 29702
PO-28
1 22829U 93061G 94111.68914797 0.00000072 46654-4 0 2720
2 22829 98.6536 188.1049 0010695 6.7035 353.4287 14.28019657 29630
Mir
1 16609U 86017A 94111.47472222 0.00005378 74698-4 0 5750
2 16609 51.6453 110.4252 0015330 168.4110 196.0636 15.58725689467190

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
April 26, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
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634. Two-Line Orbital Element Sets (TLE383)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-25 23:58:40 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.767318320@afit.af.mil>
Source record: 27791

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #383 -
Alouette 1
1 00424U 62049 94114.58320010 .00000070 00000-0 72800-4 0 9852
2 00424 80.4662 337.8983 0022185 253.8495 106.0214 13.67807058575076
ATS 3
1 03029U 67111A 94109.22555120 -.00000110 00000-0 10000-3 0 1792
2 03029 14.6091 8.1076 0009382 273.0030 261.8529 1.00272968 96841
Cosmos 398
1 04966U 71016A 94114.60517275 .00128454 66092-5 26368-3 0 1590
2 04966 51.4498 178.9453 1068510 206.2044 148.0436 13.78379312765338
Starlette
1 07646U 75010A 94111.90119346 -.00000160 00000-0 -13127-4 0 7721
2 07646 49.8239 15.4602 0206194 150.3428 210.9341 13.82185457970069
LAGEOS
1 08820U 76039A 94113.92485223 .00000030 00000-0 10000-3 0 9858
2 08820 109.8237 117.0147 0044554 297.1287 62.4757 6.38664497163687
ETS-2
1 09852U 77014A 94096.70768241 .00000056 00000-0 10000-3 0 9609
2 09852 12.0278 42.3644 0002272 355.1437 113.0291 0.99996307 9941
GOES 2
1 10061U 77048A 94113.80213159 .00000069 00000-0 10000-3 0 3185
2 10061 11.1047 46.3419 0002626 12.2557 306.7075 1.00287049 6565
IUE
1 10637U 78012A 94113.52240880 -.00000172 00000-0 10000-3 0 9931
2 10637 34.5407 95.7583 1311914 34.2192 219.8887 1.00284447 12174
GPS BI-01
1 10684U 78020A 94107.65061818 -.00000010 00000-0 10000-3 0 2610
2 10684 64.6029 47.3185 0062244 164.2115 195.9660 1.98069270103736
GPS BI-02
1 10893U 78047A 94113.69741892 -.00000005 00000-0 10000-3 0 598
2 10893 63.6211 286.1760 0214106 13.5442 346.9978 2.01627858116974
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GOES 3
1 10953U 78062A 94114.60026785 .00000069 00000-0 10000-3 0 2930
2 10953 10.0388 49.0925 0004436 58.6941 146.6798 1.00268018 11187
SeaSat 1
1 10967U 78064A 94113.57901189 .00000003 00000-0 45614-4 0 2806
2 10967 108.0036 349.2201 0001531 269.7030 90.3941 14.37948038828518
GPS BI-03
1 11054U 78093A 94111.40130718 .00000014 00000-0 10000-3 0 1731
2 11054 63.2686 283.4277 0043659 175.4641 184.5660 1.93505252113414
Nimbus 7
1 11080U 78098A 94110.68273235 -.00000052 00000-0 -88310-5 0 3845
2 11080 99.0617 356.4391 0008487 290.6987 69.3256 13.83734822782125
GPS BI-04
1 11141U 78112A 94111.85350825 -.00000027 00000-0 00000+0 0 8751
2 11141 64.6161 48.3217 0048496 24.8472 335.3765 1.92894841 2692
GPS BI-05
1 11690U 80011A 94113.06417218 -.00000032 00000-0 10000-3 0 7745
2 11690 64.9535 48.9547 0140818 195.8774 163.5641 2.00556942118437
GPS BI-06
1 11783U 80032A 94112.45619219 .00000001 00000-0 10000-3 0 9611
2 11783 62.6864 280.1032 0209542 29.3844 331.7541 2.03456265102822
GOES 5
1 12472U 81049A 94109.43698579 .00000093 00000-0 10000-3 0 7615
2 12472 6.7073 58.7183 0005671 354.3821 172.8602 1.00298898 5172
Cosmos 1383
1 13301U 82066A 94114.71377663 .00000006 00000-0 -10284-4 0 2831
2 13301 82.9338 348.9717 0025935 242.2534 117.5987 13.68053829590117
LandSat 4
1 13367U 82072A 94114.22558190 .00000125 00000-0 37701-4 0 4748
2 13367 98.1827 173.7226 0008165 63.8483 296.3552 14.57126146626202
IRAS
1 13777U 83004A 94112.06702122 -.00000285 00000-0 -16632-3 0 5867
2 13777 98.9758 304.1881 0012528 107.5590 252.6943 13.99201069243294
Cosmos 1447
1 13916U 83021A 94113.22725808 .00000060 00000-0 47450-4 0 3844
2 13916 82.9422 52.3419 0037254 180.1016 180.0143 13.74307974555783
TDRS 1
1 13969U 83026B 94112.99347153 -.00000197 00000-0 10000-4 0 2935
2 13969 7.5982 51.6942 0004200 62.8665 179.2786 1.00273021 13490
GOES 6
1 14050U 83041A 94114.65989716 -.00000101 00000-0 10000-3 0 1940
2 14050 5.5146 61.6187 0005262 329.3642 315.3744 1.00217110 12245
OSCAR 10
1 14129U 83058B 94114.79345608 -.00000048 00000-0 10000-3 0 2756
2 14129 27.1659 330.6978 6021287 173.0169 202.1666 2.05879661 53711
LandSat 5
1 14780U 84021A 94114.19489936 .00000118 00000-0 36202-4 0 597
2 14780 98.1665 175.0189 0005879 72.5271 287.6570 14.57131146539613
UoSat 2
1 14781U 84021B 94113.06431880 .00000278 00000-0 55048-4 0 6837
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2 14781 97.7895 130.3678 0013036 84.7630 275.5059 14.69195303542215
GPS BI-09
1 15039U 84059A 94114.88399248 -.00000047 00000-0 10000-3 0 1891
2 15039 63.9163 42.7291 0052747 221.2676 138.3204 2.00559314 72272
Cosmos 1574
1 15055U 84062A 94113.44013472 .00000040 00000-0 26295-4 0 5830
2 15055 82.9531 105.4283 0028687 11.9811 348.2023 13.73604305493113
GPS BI-10
1 15271U 84097A 94112.30829877 .00000002 00000-0 10000-3 0 7887
2 15271 62.3823 280.1241 0144451 348.6726 10.9882 2.00578951 69331
Cosmos 1602
1 15331U 84105A 94111.07701096 .00000537 00000-0 60797-4 0 2741
2 15331 82.5347 131.2069 0021955 35.7564 324.5110 14.84375654516047
NOAA 9
1 15427U 84123A 94113.03401474 .00000094 00000-0 74280-4 0 7927
2 15427 99.0573 162.8608 0015626 18.5865 341.5881 14.13608855482553
GPS BI-11
1 16129U 85093A 94105.19791667 -.00000022 00000-0 10000-3 0 5826
2 16129 64.7044 45.1922 0140135 148.8942 294.6332 1.93432400 8888
Mir
1 16609U 86017A 94112.56385297 .00005081 00000-0 70934-4 0 5779
2 16609 51.6454 104.9586 0014931 172.0896 188.0328 15.58737597467377
SPOT 1
1 16613U 86019A 94112.82978498 .00000089 00000-0 62356-4 0 6689
2 16613 98.6942 187.4469 0001265 36.7608 323.3655 14.20056231108707
Cosmos 1766
1 16881U 86055A 94114.19675075 .00000505 00000-0 58358-4 0 1914
2 16881 82.5206 186.3034 0021199 48.3313 311.9695 14.83413531417456
EGP
1 16908U 86061A 94113.54482181 -.00000097 00000-0 00000+0 0 8801
2 16908 50.0086 252.3911 0011588 172.9433 187.1566 12.44409494 18587
NOAA 10
1 16969U 86073A 94108.89085333 .00000018 00000-0 25824-4 0 6863
2 16969 98.5082 119.7012 0013675 138.3495 221.8729 14.24879342394169
MOS-1
1 17527U 87018A 94113.82905584 .00000091 00000-0 99794-4 0 628
2 17527 99.0372 183.6516 0001666 29.4863 330.6392 13.94903678365364
GOES 7
1 17561U 87022A 94111.25437336 -.00000050 00000-0 10000-3 0 8199
2 17561 1.4301 76.5121 0004425 326.6604 145.2216 1.00275033 9400
Kvant-1
1 17845U 87030A 94114.93598073 .00018232 00000-0 23659-3 0 8269
2 17845 51.6449 93.0541 0014969 180.1738 180.0031 15.58777265467817
DMSP B5D2-3
1 18123U 87053A 94113.01182931 .00000057 00000-0 51874-4 0 4504
2 18123 98.7897 305.5313 0014434 342.5346 17.5330 14.15350868353201
RS-10/11
1 18129U 87054A 94112.22132617 .00000050 00000-0 37961-4 0 8912
2 18129 82.9282 10.2138 0010922 172.2691 187.8635 13.72335446342231
Meteor 2-16
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1 18312U 87068A 94114.87777901 .00000063 00000-0 43325-4 0 2813
2 18312 82.5525 254.1290 0010894 264.2874 95.7045 13.84027913337687
Meteor 2-17
1 18820U 88005A 94111.01064387 .00000044 00000-0 25730-4 0 2807
2 18820 82.5405 314.0754 0016786 347.5650 12.5094 13.84713913314444
DMSP B5D2-4
1 18822U 88006A 94113.00477743 .00000054 00000-0 42735-4 0 5533
2 18822 98.4498 330.2427 0006701 135.6784 224.4934 14.22944578322678
Glonass 34
1 19163U 88043A 94109.29326758 .00000100 00000-0 10000-3 0 8813
2 19163 65.0157 112.4201 0007027 167.1724 192.8721 2.13102252 45402
Glonass 36
1 19165U 88043C 94109.34906695 .00000100 00000-0 10000-3 0 2752
2 19165 64.9968 112.3900 0004664 321.7074 38.2878 2.13102295 46029
METEOSAT 3
1 19215U 88051A 94111.47963487 -.00000257 00000-0 10000-3 0 8925
2 19215 1.6111 72.9530 0000349 302.7215 291.0586 1.00287486 9345
AO-13
1 19216U 88051B 94114.36934900 -.00000468 00000-0 10000-4 0 9055
2 19216 57.8413 256.1944 7213809 339.7848 2.0604 2.09724652 13386
OKEAN 1
1 19274U 88056A 94112.98089360 .00000335 00000-0 39056-4 0 8919
2 19274 82.5099 287.3072 0018939 187.5666 172.5264 14.82153005312907
Meteor 3-2
1 19336U 88064A 94114.75460304 .00000051 00000-0 10000-3 0 2786
2 19336 82.5437 1.4984 0018622 39.2083 321.0373 13.16966504276222
Glonass 39
1 19503U 88085C 94113.59804030 -.00000033 00000-0 10000-3 0 1739
2 19503 65.7515 351.1651 0006242 179.3785 180.6735 2.13102132 43603
NOAA 11
1 19531U 88089A 94112.90896509 .00000086 00000-0 71085-4 0 6081
2 19531 99.1695 100.4743 0011162 293.0791 66.9203 14.12977977287413
TDRS 2
1 19548U 88091B 94111.39853153 -.00000289 00000-0 10000-3 0 9035
2 19548 0.8920 77.8636 0002716 301.6353 270.9393 1.00262481 7635
Glonass 40
1 19749U 89001A 94108.94490553 .00000097 00000-0 10000-3 0 3836
2 19749 64.9601 112.0042 0007821 258.6498 101.3009 2.13101398 41016
Glonass 41
1 19750U 89001B 94114.16328920 .00000086 00000-0 10000-3 0 2777
2 19750 64.9672 111.8916 0007295 255.0004 104.9049 2.13101591 41144
GPS BII-01
1 19802U 89013A 94110.88561617 .00000083 00000-0 10000-3 0 8936
2 19802 55.0958 141.9966 0032448 180.8566 179.2028 2.00579478 37905
Akebono
1 19822U 89016A 94112.25477430 .00008530 00000-0 42395-3 0 2473
2 19822 75.0964 214.0847 3828162 331.8953 11.8630 7.77392570104947
Meteor 2-18
1 19851U 89018A 94111.19644899 .00000069 00000-0 48393-4 0 2793
2 19851 82.5218 189.3509 0015717 31.1221 329.0865 13.84362770259806
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MOP-1
1 19876U 89020B 94112.79249126 -.00000078 00000-0 00000+0 0 184
2 19876 0.3370 57.9052 0001145 345.6261 83.8692 1.00274349 6510
TDRS 3
1 19883U 89021B 94113.49565588 -.00000273 00000-0 00000+0 0 9056
2 19883 0.0175 62.3548 0001990 267.5776 18.7079 1.00267407 88916
GPS BII-02
1 20061U 89044A 94114.72310041 -.00000046 00000-0 10000-3 0 9154
2 20061 54.6843 318.6286 0127823 207.2446 152.1053 2.00565935 35722
Nadezhda 1
1 20103U 89050A 94113.60493703 .00000049 00000-0 35521-4 0 9834
2 20103 82.9603 328.0190 0039177 81.1415 279.4169 13.73837044240819
GPS BII-03
1 20185U 89064A 94114.56094544 .00000085 00000-0 10000-3 0 9020
2 20185 54.9225 142.4922 0010718 264.6301 95.2968 2.00574912 34295
GMS 4
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SEDS 2
1 23028U 94016B 94115.16960569 .00515438 10634-3 10839-2 0 512
2 23028 32.3483 32.0698 0007780 271.0991 225.1875 15.97696889 7273
ProgressM22
1 23035U 94019A 94114.93598073 .00018232 00000-0 23659-3 0 400
2 23035 51.6449 93.0541 0014969 180.1738 180.0031 15.58777265 5284
Cosmos 2275
1 23043U 94021A 94114.00386437 -.00000036 00000-0 00000+0 0 00
2 23043 64.8128 351.2567 0004348 196.4068 163.6358 2.13135394 277
Cosmos 2276
1 23044U 94021B 94113.46347136 -.00000035 00000-0 00000+0 0 170
2 23044 64.8001 351.2886 0080740 286.0100 73.1622 2.15766018 268
Cosmos 2277
1 23045U 94021C 94113.53545740 -.00000036 00000-0 00000+0 0 03
2 23045 64.8112 351.2812 0006896 198.9266 161.1032 2.13119989 265
1994021F
1 23048U 94021F 94113.99321130 -.00000036 00000-0 00000+0 0 146
2 23048 64.8017 351.2621 0006449 250.0354 109.9436 2.13315218 195
1994021G
1 23049U 94021G 94115.08622163 .00000020 00000-0 24508-4 0 145
2 23049 64.8017 346.6443 5802852 296.8016 16.0820 4.23183777 490
1994021H
1 23050U 94021H 94113.66784069 .00000986 00000-0 83056-3 0 124
2 23050 64.8628 347.0638 5804013 296.8733 16.0531 4.23204389 434
GOES 8
1 23051U 94022A 94114.41744171 -.00000255 00000-0 00000+0 0 258
2 23051 0.8044 125.4443 1487032 177.2621 43.8758 0.98189112 18
1994022B
```

```
1 23052U 94022B 94113.99450845 .00068101 -12524-5 47862-3 0 145
2 23052 27.0555 109.2209 7619438 184.1510 160.3827 1.91580617 217
1994023A
1 23087U 94023A 94114.67531186 .00000136 00000-0 10000-3 0 56
2 23087 71.0065 15.4861 0004205 65.7651 294.5631 14.12129263 198
1994023B
1 23088U 94023B 94115.23972612 -.00006644 00000-0 -34886-2 0 119
2 23088 71.0075 14.2759 0005295 306.8161 53.2479 14.13769448 284
1994023C
1 23089U 94023C 94115.15244280 .00029842 00000-0 28537-1 0 55
2 23089 71.0310 15.0167 0201663 94.2063 268.2675 13.71652411 274
1994023D
1 23090U 94023D 94114.93234159 -.00000031 00000-0 10000-4 0 22
2 23090 71.0387 15.5105 0193091 70.5993 292.7605 13.73111562 253
1994023E
1 23091U 94 23 E 94114.93419756 -.00000213 00000-0 -18932-3 0 14
2 23091 70.9821 14.9130 0202131 94.4282 267.9930 13.71137460 245
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

635. Radio Astronomy

Newsgroup: rec.radio.amateur.space
Date: 1994-04-26 09:28:17 UTC
From: "J Paul Lesso"@ee.ed.ac.uk
Message-ID: <Cov0z7.69A@festival.ed.ac.uk>
Source record: 27788

Keywords: radios n stuff

I enjoy astronomy as a hobby but have recently become interested in
radio astronomy, speciifically listening to Jupiter 20MHz and also the bands
that can be used to listen to meteors. Any FTP sites, publications or any
help would be most appreciated!

TIA

Paul

636. STS-xx QSL routes??

Newsgroup: rec.radio.amateur.space
Date: 1994-04-26 15:17:12 UTC
From: hardie@herald.usask.ca
Message-ID: <2pjb9o$q2i@tribune.usask.ca>
Source record: 27789

Some time ago somebody posted a list of the QSL routes for all the shuttle missions so far. I carefully saved the file and then equally carefully deleted it.
Specifically, I need the QSL route for STS-60 for a packet contact but would like the whole list if it's still around.
Thanks
Pete
ve5va.qrp@usask.ca
--
ve5va.qrp@usask.ca

637. SAREX QSL information

Newsgroup: rec.radio.amateur.space
Date: 1994-04-26 18:43:00 UTC
From: manfred@isi8.ssl.berkeley.edu
Message-ID: <2pjnbk$30q@agate.berkeley.edu>
Source record: 27790

```
SAREX QSL Information
++++++++++++++++++++++++++

Mission QSL address
================================================================================

STS-35 Frank Bauer, KA3HDO
Columbia 9609 Tuckerman Ct.
02Dec90 Seabrook, MD 20706

STS-37 Frank Bauer, KA3HDO
Atlantis 9609 Tuckerman Ct.
05Apr91 Seabrook, MD 20706

STS-45 Sterling Park ARC
Atlantis P.O. Box 599
24Mar92 Sterling, VA 22170

STS-50 Dayton Amateur Radio Association
Columbia c/o Keith Baker, KB1SF
03Jun92 P.O. Box 44
Dayton, OH 45401

STS-47 Dr. Jay Apt, N5QWL
Endeavour 806 Shorewood Dr.
12Sep92 Seabrook, TX 77586

STS-56 STS-56 QSL
Discovery c/o Vienna Wireless Society
08Apr93 P.O. Box 418
Vienna, VA 22183

STS-55 IBM Amateur Radio Club/1993
Columbia P.O. Box 1328
26Apr93 Boca Raton, FL 33429-1328

STS-57 STS-57 QSL
Endeavour c/o Miami County ARC
21Jun93 P.O. Box 214
Troy, OH 45373

STS-58 ARRL
Columbia SAREX STS-58 QSL
18Oct93 Education Activities Division
225 Main St.
Newington, CT 06111
```

STS-60 ARRL
Discovery SAREX STS-60 QSL
03Feb94 Education Activities Division
225 Main St.
Newington, CT 06111

STS-59 ARRL
Endeavour SAREX STS-59 QSL
09Apr94 Education Activities Division
225 Main St.
Newington, CT 06111

Questions or concerns regarding the QSL distribution:
contact Frank H. Bauer at ka3hdo@amsat.org.

Hope this is helpful.
73, W6/DL5KR
Manfred

638. FT-726R SAT RIG FOR SALE, ALSO ICOM 275A

Newsgroup: rec.radio.amateur.space
Date: 1994-04-26 23:12:10 UTC
From: BIDDLEAP@ctrvax.Vanderbilt.Edu
Message-ID: <1994Apr26.231210.6818@news.vanderbilt.edu>
Source record: 27521

More shack cleaning.

For sale:

Yaesu FT-726R All mode multiband tranceiver.

Includes:

HF module (15-12-10 meters)
2 meter module
70 cm module (430-440 MHz)
Full duplex (for satellite use)
All manuals
Standard hand mike
MD-1B8 desk mike

It is in excellent condition, both electically and
mechanically, and was used for both analog and digital ham
satellites, as well as terrestrial packet.

Package deal only. $850 including shipping.

.....
Icom 275A 2 meter all mode tranceiver.
Used only a couple of hours. Absolutely mint. Everything in
original box. About 2 years old. I just don't need two of
them. (Please don't ask! :>)

$800 including shipping.

Alan Biddle
615-776-2056

Recommended
four
line
signature.

639. Re: Satellites without beams

Newsgroup: rec.radio.amateur.space
Date: 1994-04-26 23:51:14 UTC
From: wa4ymz@aol.com
Message-ID: <2pk9di$2gm@search01.news.aol.com>
Source record: 27792

In article <2pcbn2$58e@oak.oakland.edu>, prvalko@vela.acs.oakland.edu (prvalko) writes:

....routinely work RS-10/11 with 10 watts.

Thanks, Paul. That looks like it will be my first shot. I've got an Isopole for 2M so I'm set. 29 MHz antenna is an R-7. From my location, RS-12 is much louder than RS-10 even though both are 10M downlink. HF rig is a TS-690, so the receive should be pretty good. Any reason for the disparity that you know of? Are you using a pre-amp? Any suggestions? Tnx.

73, Gary WA4YMZ

640. Re: Radio Astronomy

Newsgroup: rec.radio.amateur.space
Date: 1994-04-27 02:55:11 UTC
From: phiscock@ee.ryerson.ca
Message-ID: <2pkk6f$100f@hermes.acs.ryerson.ca>
Source record: 27793

J Paul Lesso (JPaulLesso@ee.ed.ac.uk) wrote:
: Keywords: radios n stuff

: I enjoy astronomy as a hobby but have recently become interested in
: radio astronomy, speciifically listening to Jupiter 20MHz and also the bands
: that can be used to listen to meteors. Any FTP sites, publications or any
: help would be most appreciated!

: TIA

: Paul

How about 'Radio Astronomy and How To Build Your Own Telescope'
John Heywood, Arc Books, $0.95, 1969.
All the electronics is tube thingies, but the concepts are still
valid.

Cheers -
Peter

--
Peter Hiscocks Phone: (416) 979-5000 Ext 6109
Department of Electrical Engineering Fax: (416) 979-5280
Ryerson Polytechnical University, Toronto, Canada

The finite speed of light: God's way of limiting
the spread of McDonalds restaurants.

641. Re: Radio Astronomy

Newsgroup: rec.radio.amateur.space
Date: 1994-04-27 05:12:11 UTC
From: daveb@magneton.physics.Arizona.EDU
Message-ID: <1994Apr27.051211.17848@galileo.physics.arizona.edu>
Source record: 27794

In article <Cov0z7.69A@festival.ed.ac.uk> J Paul Lesso@ee.ed.ac.uk (J Paul Lesso) writes:
>Any FTP sites, publications or any
>help would be most appreciated!

One good beginners reference is the "Amateur Radio Astronomer's
Handbook" by John Potter Shields (ISBN 0-517-55810-6). Published in
1986, it has some good introductory information on radio astronomy
history, theory, and observing (including chapters on receiving
18-22 MHz signals from Jupiter and meteor signals). Good luck!

--
Dave Burnett | daveb@magneton.physics.arizona.edu
Department of Physics | -or- wd8krv@amsat.org
University of Arizona |
Tucson, AZ 85721 | "We do bubbles best..."

642. Ao-21 via mobile?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-27 07:23:55 UTC
From: da884@cleveland.Freenet.Edu
Message-ID: <2pl3ub$8j3@usenet.INS.CWRU.Edu>
Source record: 27795

I read alittle while back about being able to operate Ao21 via low power?
If so can anyone give me info on it I'll like to give it a shot
I'm working the grave yardshift so I have the wee hours of the morning to
give it a shot.

I know there was talk about trying it late in the morning when most operators are asleep
and not to many big stations are up and running, Any help??

--

```
_____________________________________________________________________________
| David AMPRnet - ve3tos@ve3tos.ampr.org www |
|Don Mills, Ontario Internet - da884@cleveland.freenet.edu (o o) |
|_Canada____VE3TOS_____Packet - ve3tos@va3bbs.#scon.on.can.noam_oOO__(_)__OOo|
```

643. Re: Ao-21 via mobile?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-27 17:48:24 UTC
From: ip@g8sjp.demon.co.uk
Message-ID: <767468904snz@g8sjp.demon.co.uk>
Source record: 27796

In article <2pl3ub$8j3@usenet.INS.CWRU.Edu>
da884@cleveland.Freenet.Edu "David Toste" writes:

> I read alittle while back about being able to operate Ao21 via low power?

Me too.

> If so can anyone give me info on it I'll like to give it a shot

I tried it. 50W ERP and no sign of a signal being relayed. I heard (on Sunday)
a 'local' through the bird, and I could hear his uplink signal, too. He was
just about fully readable via satellite. I asked him about his setup, and
what he described equated to roughly 1.4KW ERP. On that basis, I'll stay
listening :-(

--
Iain Philipps

644. Re: rec.radio.amateur.vhf.plus (?)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-27 21:49:40 UTC
From: mmt@RedBrick.COM
Message-ID: <1994Apr27.214940.22774@RedBrick.COM>
Source record: 27797
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.policy,news.groups,alt.config

In article <2pblak$oj9@spool.cs.wisc.edu>, jhanson@yar.cs.wisc.edu (Jason Hanson) writes:
[...]
>2) Try starting up an alt.radio.amateur.vhf-plus first and see how it does,
>this requires no votes, etc. and will tell you whether or not support is there
>for a group in the "real" usenet. (I can probably help with this if you need
>it.)
[...]

Please don't do this! Alt.* is not a trial hierarchy.

If you think there is enough traffic for a rec group, then put
in the RFD for it. (A pre-existing mailing list is a great way
to demonstrate such traffic).

If it fails the vote, *then*, by all means, propose the alt group.
This would be a much more legitimate use for alt.* and will help
keep it less cluttered.

Followups to news.groups, where this discussion belongs.

--

Maxime Taksar KC6ZPS mmt@RedBrick.COM PGP key by request
GCS/O d- -p+ c+ !l u+ e+ m+ s++/ !n(---) h f+ g+ w+++ t+ r(-) y?
"Remember, a no-smoking section in a restaurant is like a
no-peeing section in a pool" --EGK

645. ARLS021 Another SAREX success

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 00:35:50 UTC
From: marcbg@netcom.com
Message-ID: <$arls021.1994@ampr.org>
Source record: 27800
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

```
SB SPACE @ ARL $ARLS021
ARLS021 Another SAREX success

ZCZC AS65
QST de W1AW
Space Bulletin 021 ARLS021
>From ARRL Headquarters
Newington, CT April 26, 1994
To all radio amateurs

SB SPACE ARL ARLS021
ARLS021 Another SAREX success

Another SAREX success

During the just-completed shuttle mission, STS-59, astronauts Jay
Apt, N5QWL, and Linda Godwin, N5RAX, used their SAREX 2-meter
equipment for a contact with Astronaut Ken Cameron, R3/KB5AWP, on
assignment at the Russian space facility at Star City, near Moscow.

The two astronaut-hams also spoke to cosmonaut Anatoli Artsibartski,
U6MIR. The contacts were made on two successive passes overhead.

Jay Apt said ''Ken is my friend and former STS-37 crewmate. It was
terrific to hear his voice after several months corresponding by
e-mail only. What a great way to use ham radio.''

Cameron and Artsibartski were standing near the Star City statue of
Russian cosmonaut Yuri Gagarin, using a hand held transceiver and
5/8 wavelength whip antenna, standing on a car to increase their
elevation, astronaut Jay Apt related in an Amateur Radio packet
message from space.
NNNN
--
Marc Grant
Home: marcbg@netcom.com Telephone: 214-205-4593
Office: marcbg@esy.com Amateur Radio N5MEI
"The road to enlightment is chuck full o' potholes"
```

646. Re: 48-Hours & Unidentified radio signals.

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 02:34:25 UTC
From: kchen@apple.com
Message-ID: <2pn7bi$4p1@apple.com>
Source record: 27798

palmer@alumni.caltech.edu (David M. Palmer) writes:

>fsrla@aurora.alaska.edu writes:

>>What got my attention, however, was the segment on the
>>radio-telescope facility that was scanning the skies in
>>search of hopeful radio contact, or sounds, or, well,
>>anything out of the norm. They had 37 signals they
>>could not identify.

>>Now, my question is, does anybody know what frequencies
>>these 37 signals were heard on? I'm just curious.

>Horowitz and Sagan, 1993 Sept 20, Astrophysical Journal V. 415, 218-235.
^^^^^^^^

Note of interest: Paul Horowitz is W1HFA. Also coauthor with Hill for
"The Art of Electronics."

73,

Kok Chen, AA6TY kchen@apple.com
Apple Computer, Inc.

647. Re: Ao-21 via mobile?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 02:40:37 UTC
From: da884@cleveland.Freenet.Edu
Message-ID: <2pn7n5$ark@usenet.INS.CWRU.Edu>
Source record: 27799

```
IP>
IP> > I read alittle while back about being able to operate Ao21
IP>
IP> Me too.
IP>
IP> > If so can anyone give me info on it I'll like to give it a
IP>
IP> I tried it. 50W ERP and no sign of a signal being relayed. I
IP> heard (on Sunday) a 'local' through the bird, and I could
IP> hear his uplink signal, too. He was just about fully
IP> readable via satellite. I asked him about his setup, and
IP> what he described equated to roughly 1.4KW ERP. On that
IP> basis, I'll stay listening :-(
IP>

What are the Up and down link freqs???

--

_____________________________________________________________________________
| David AMPRnet - ve3tos@ve3tos.ampr.org www |
|Don Mills, Ontario Internet - da884@cleveland.freenet.edu (o o) |
|_Canada____VE3TOS_____Packet - ve3tos@va3bbs.#scon.on.can.noam_oOO__(_)__OOo|
```

648. ARLS022 Astronauts at HamVention

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 13:19:29 UTC
From: marcbg@netcom.com
Message-ID: <$arls022.1994@ampr.org>
Source record: 27802
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS022
ARLS022 Astronauts at HamVention

ZCZC AS66
QST de W1AW
Space Bulletin 022 ARLS022
>From ARRL Headquarters
Newington, CT April 26, 1994
To all radio amateurs

SB SPACE ARL ARLS022
ARLS022 Astronauts at HamVention

Astronauts at HamVention

A space forum at the Dayton HamVention will feature two NASA shuttle astronaut-hams, Tony England, W0ORE, and Steve Nagel, N5RAW. The forum will commemorate 10 years of Amateur Radio aboard the shuttles.

Tony England flew on the second ham radio mission, in 1985, while Steve Nagel, a veteran of several shuttle flights, most recently commanded shuttle flight STS-55 in 1993. The two will discuss their Amateur Radio experiences from space and answer questions.

Also at the forum will be members of the ARRL SAREX Working Group, including ARRL Educational Activities Manager Rosalie White, WA1STO, and Roy Neal, K6DUE, a principal coordinator of the shuttle Amateur Radio project.

The forum is scheduled for 1 PM on Saturday, April 30, in Forum Room 5 at Hara Arena.
NNNN
--
Marc Grant
Home: marcbg@netcom.com Telephone: 214-205-4593
Office: marcbg@esy.com Amateur Radio N5MEI
"The road to enlightment is chuck full o' potholes"

649. HR AMSAT NEWS SERVICE BULLETIN 106.04

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 14:01:08 UTC
From: marcbg@netcom.com
Message-ID: <$ans10604.1994@ampr.org>
Source record: 27801
Cross-posted to: rec.radio.amateur.misc,rec.radio.info,rec.radio.amateur.space

HR AMSAT NEWS SERVICE BULLETIN 106.04 FROM AMSAT HQ
SILVER SPRING, MD APRIL 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-106.04

Weekly OSCAR Status Reports: 16-APR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
20-Apr-94 7:35 -to- 27-Apr-94 7:55 UTC
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

STS-59: To obtain a QSL, either as a result of a SWL or for a QSL, send your report or QSL to ARRL EAD, STS-59 QSL, 225 Main Street, Newington, CT 06111, USA. Include the following information in your QSL or report: STS-59, date, time in UTC, frequency and mode (FM voice or packet). In addit-ion, you must also include an SASE (or sufficient IRCs) using a large, business-sized envelope if you wish to receive a card. The Orange Park Amateur Radio Club in Florida has generously volunteered to manage the cards for this mission. [Bob Inderbitzen (NQ1R) Assistant to the Manager, ARRL Educational Activities]

KO-23: Working well and has a new pair of images. [WH6I]

KO-25: Working well. A number of new images can be found on KO-25 but since the wide angle images are in a new format that so far has not been decoded, and since narrow angle images are very hard to locate in the absence of the companion wide angle image there is very little to get out of the images that are available. [WH6I]

AO-16: Working well. WH6I notes that usage on the 1200 baud OSCARS has has dropped off considerably. [WH6I]

LO-19: Working well. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

--

Marc Grant
Home: marcbg@netcom.com Telephone: 214-205-4593
Office: marcbg@esy.com Amateur Radio N5MEI
"The road to enlightment is chuck full o' potholes"

650. STS-65 Element Set (94189.762)

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 16:46:33 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94189.762@alsys.com>
Source record: 27803
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 00065U 94189.76284929 .00052344 00000-0 15762-3 0 37
2 00065 28.4664 13.0731 0003571 330.7493 29.2906 15.90324781 23

Satellite: STS-65
Catalog number: 00065
Epoch time: 94189.76284929 = (08 JUL 94 18:18:30.18 UTC)
Element set: 003
Inclination: 28.4664 deg
RA of node: 13.0731 deg Space Shuttle Flight STS-65
Eccentricity: .0003571 Prelaunch Element set JSC-003
Arg of perigee: 330.7493 deg Launch: 08 JUL 94 17:06 UTC
Mean anomaly: 29.2906 deg
Mean motion: 15.90324781 rev/day Gil Carman, WA5NOM
Decay rate: 5.2344e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 2

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

651. Jupiter Radio Observations

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 20:49:52 UTC
From: garcia@astro.ufl.edu
Message-ID: <2pp7hgINN9cs@no-names.nerdc.ufl.edu>
Source record: 27804

A postscript version of this file jupradio.ps, as well as the figure, hist.ps, mentioned in the text is available via anonymous ftp to astro.ufl.edu in the /pub/jupiter directory.

****
THE JOVIAN DECAMETRIC EMISSION AND THE COLLISION OF COMET SHOEMAKER-LEVY 1993e.

The Jovian Decametric Emission.

The Jovian decametric emission was discovered in 1955 by B.F. Burke and K.L. Franklin at the frequency of 22.2 MHz. The emission has an upper cutoff frequency of 39.5 MHz. It can be detected from ground based stations from the upper cutoff frequency of the emission down to the cutoff frequency of the terrestrial ionosphere which is usually around 5 to 10 MHz. The peak of the intensity of the emission occurs at around 8 MHz. The emission occur in episodes called "storms". A storm can last from a few minutes to several hours. Two distinctive types of bursts can be received during a storm. The L bursts (L for Long) are bursts that vary slowly in intensity with time. They last from a few seconds to several tens of seconds and have instantaneous bandwidth of a few MHz. The S bursts (S for Short) are very short in duration, have instantaneous bandwidth of a few kHz to a few tens of kHz, and drift downward in frequency at a rate of typically -20 MHz/sec. They arrive at a rate of a few to several hundred bursts per second. In a 5 kHz bandwidth receiver they last only a few milliseconds. Sometimes both types of bursts can be heard simultaneously. The emission is believed to be beamed into a thin hollow cone with axis parallel to the direction of the magnetic field lines in the region where the emission originates (near the magnetic poles). The probabilities of detecting the emission depend strongly on the values of the Jovian central meridian longitude (CML), the Io Phase, and the Jovicentric declination of the Earth (DE). The CML is the value of the System III longitude of Jupiter facing the Earth. The Io Phase is the angle of Io, one of Jupiter's moons, with respect to superior geocentric conjunction. The regions in the CML-Io phase plane that have increased probabilities of emission are called sources. The sources are named Io-A, Io-B, and Io-C for the Io-controlled emission and A, B, and C for the Non-Io controlled emission.

Source CML Io Phase Characteristics of emission

Io-related sources
Io-A 200-290 195-265 RH polarized, mostly L bursts
Io-B 90-200 75-105 RH polarized, mostly S bursts
Io-C 290-10 225-250 LH polarized, L and S bursts

Non-Io related sources
A 200-290
B 90-200
C 290-10

The Collision of Comet Shoemaker-Levy 1993e and the Possible Effects on the Low Frequency Radio Emission.

Comet Shoemaker-Levy 1993e will impact Jupiter between July 16 and 22, 1994. Extreme tidal forces exerted by Jupiter broke the nucleus up into at least 21 fragments during a close pass by the planet about two years ago. The largest of the fragments are about 2 to 4 km in diameter. Over a period of about six days, each fragment will penetrate Jupiter's magnetosphere and explode at about the cloud-top level of the atmosphere, creating a fireball that may rise to the altitude of Jupiter's ionosphere. Since the fireballs will occur just beyond Jupiter's limb as viewed from the Earth, they will not be visible unless they rise to unexpectedly great heights.
It is not known whether the passage of the fragments through the magnetosphere and their collision with Jupiter will create radio emissions that are detectable from Earth. An electric field will be induced in the nuclei as they pass through the Jovian magnetic field, an effect similar in nature to that experienced by the satellite Io. However the plasma density around the comet and the magnitude of the electric field induced may be too low and cause only weak radio emission (unless something unexpected happens that could suddenly increase the amount of ionized gas around the comet). Several suggestions has been made regarding the possibility of emission at different stages of the passage and entry into the jovian ionosphere and atmosphere. One suggestion is that the interaction of the fragments with the Jovian ionosphere may trigger decametric emission in the last 10-20 seconds before the explosion. Another suggestion is that low frequency electromagnetic radiation could be emitted by the plasma released during the fireball. In this case the emission may be in the form of short pulses of electromagnetic radiation. Another possibility is the stimulation of lighting discharges from lower altitudes after the fireballs have developed. This emission may be in the form of almost continuous noise originating in the possible large number of lightings discharges. Since the fireball will occur on the far side of the planet it is unlikely that direct radio emission could be detected from ground based observations. There have been suggestions that ducting of the radio emission in the layered ionosphere around the limb of the planet might make possible its detection from Earth. Apparently no estimates for the intensity of these types of

emission are yet available.
Still one more possibility is that plasma released by the comet and plasma generated by the fireball may affect the well known decametric emission. If this plasma diffuses along lines of magnetic field and reaches the region where the decametric emission is generated, it may alter the probabilities of emission or it may have a quenching effect of the emission in particular at the low frequencies. These changes in the behavior of the decametric emission may not be easily detectable, at least for an occasional observer. It will be necessary to make systematic observation of the emission for several months prior to the collision in order to establish a baseline for the probabilities, the intensity, bandwidth, etc. of the emission. As was mentioned above, the decametric emission is sporadic but the probabilities of receiving the emission are larger for some particular configurations of central meridian longitude (CML) and Io phase. Careful radio observations will be made from various locations in an attempt to ascertain which of these situations prevail during the impacts. Whatever information can be determined in this way will be of great value in the investigation of the origins of Jupiter's radio emissions.
The University of Florida Radio Observatory (UFRO) has been observing the Jovian decametric emission since 1957. For the present apparition the UFRO started observing in January, 1994 at several frequencies between 18 to 32 MHz. The observations will be extended through at least August to be able to observe during the collision of comet Shoemaker-Levy 9 with Jupiter.

Observing the Jovian Decametric Emission.

There have been reports of detection of the Jovian decametric emission with simple half wavelength dipole antennas or low gain antennas such as the long-wire type or loop antennas. Such low gain antennas may allow the detection of only very strong bursts. Antennas with gains of 6-10 dB with respect to a half wavelength dipole are more suitable for detecting the emission. Yagi (5-elements) and log periodic antennas usually have gains in this range. These higher gain antennas connected to HF amateur radio receivers can easily detect most of the strong part of the Jovian decametric radio emission. It will be necessary for good reception of Jupiter that the antenna points towards the planet. This may be difficult since most amateur antennas only have azimuthal control. Most amateur HF radio receivers are suitable for detecting the emission since they have a relatively narrow passband and adequate noise figure. The relative narrow band of these receivers will help in tuning away from radio stations. It will be necessary to disable the AGC of the receiver otherwise the signal will be badly compressed. An observing frequency between 18-22 MHz is recommended. At frequencies below 18 MHz strong interference from stations and static is expected. At frequencies higher than 22 MHz, the probabilities of detecting

the emission drop sharply because of the drop in intensity of the emission (see attached histogram of occurrence probability). Although the low solar activity expected for this year is a favorable condition for detecting the emission during the period of the collision, the low value of DE (around -3.4 degrees for July, 1994) reduces the probabilities of detection.

As a reference, the minimum detectable flux density (power per unit area per unit bandwidth) expected for an 8 dB gain linearly polarized antenna connected to a receiver having a 5 kHz bandwidth and an output time constant of 1 second is of the order of 5X10^-22 wm^-2Hz^-1 at a frequency of 18 MHz. Jovian decametric radio emission with peak flux densities in the range of 10-100X10^-22 wm^-2Hz^-1 are common. Expressing the flux density in Jansky (Jy), a unit more commonly used in radio astronomy, these peak flux densities are 100,000 to 1,000,000 Jy (1 Jy= 1X10^-26 wm^-2Hz^-1). In terms of power and voltage at the input of a receiver,10x10^-22 wm^-2Hz^-1 is equivalent to a power of 1x10-9 microwatt or 0.23 microvolt over 50 Ohms.

A few more additions need to be considered if the information gathered is to used for scientific purposes. A source of calibrated noise is necessary in order to calibrate the intensity of the signal. As an example, an HP 461A amplifier can be used as a noise source (with a variable attenuator), but the noise temperature of the amplifier must be calibrated against a standard noise source such as the type 5722 current-saturated noise diodes. Timing information is also an important consideration. WWV timing signals can provide adequate timing information. The ability to identify the Jovian emission and separate it from stations, static, or other types of interference is also important. Recording of the receiver output in paper chart records provide a nice way of monitoring the emission. The chart records can be used for further data reduction and analysis, but their use is sometimes time consuming. A personal computer with an A/D converter will provide a better way to store, retrieve, and process the information (if further data reduction and analysis are to be made). Time constants of about 1 second are adequate for recording the envelope of the emission. Shorter time constants (10-20 milliseconds or shorter) are necessary to resolve the faster S bursts.

The University of Florida Radio Observatory (UFRO) has generated a listing of the prediction of the configurations of CML, Io Phase, the active sources, and the probabilities of emission at 26.3 MHz for the months of April, May, June, July, and August, 1994. The probabilities at 26.3 MHz are valid for an antenna of large collecting area (These probabilities were obtained with the 640 dipoles of the UFRO 26.3 MHz Large Array), and are included as reference only. Probabilities at 18 MHz and other frequencies (obtained with Yagi antennas with gains around 8 dB) may be added later. For those having access to Internet, the files containing a short explanation and the predictions are

accessible at the ftp site astro.ufl.edu; the files are in the
pub/jupiter directory and are called README.DOC and april94.txt,
may94.txt, june94.txt, july94.txt, and aug94.txt. Questions or
comments regarding the predictions can be sent to L. Garcia at
garcia@astro.ufl.edu.

Francisco Reyes
E-Mail:reyes@astro.ufl.edu
Phone:(904) 392-7749

Leonard Garcia
E-Mail:garcia@astro.ufl.edu
Phone:(904) 392-0668

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Fax (904) 392-5089
03/27/94

--
****
* Leonard N. Garcia * garcia@astro.ufl.edu *
* Astronomy Department * *
* University of Florida * *
* P.O. Box 112055 * *
* Gainesville, FL 32611-2055 * *
****

652. SAREX and Baycom ?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-28 21:05:21 UTC
From: mac20@bonjour.cc.columbia.edu
Message-ID: <2pp8eh$ega@apakabar.cc.columbia.edu>
Source record: 27805

I have not had much luck (read; any) trying to connect to a number of different shuttle missions in the last year or more.
we have a decent satelite antenna tower and 25 watts out and i'm wondering if i'm doing anything systematically wrong.

- Our "all-mode" 2 meter only allows 5 KHz step increments, this isn't fatal is it?

- What parameters are recommended for Baycom? is this anything different then a full TNC? how frequently should you send out your packets in this duplex situation?

- Anyone know of any partiuclarly useful incantations i should be reciting?

Fortitude is a better term then banging your head against the wall.

Mike Cecere KF2NV
Applied Physics Department
Columbia University

653. Re: Ao-21 via mobile?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-29 05:43:47 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <2pq6qk$99f@usenet.INS.CWRU.Edu>
Source record: 27806

Re AO-21 Mobile: I normally work OSCAR 21 with about 20 watts into a six element beam, but I've gotten into the satellite twice with 20 watts into a dual band whip mounted on the trunk of my car.

The first time, the bird was almost directly overhead - at least 80 degrees above the horizon. It was about 2:00 AM CDT and the downlink was completely quiet - nobody was using it at all. I gave a "what the heck" call and was startled to hear myself on the downlink. I called CQ and N7POR came back to me from Seattle. We had about a fifteen second QSO before I lost the bird. I was parked between two minivans at the time, which may have acted like reflectors.

The second time was at 11:05 UT, to WA2GSY in N.J. AO-21 was about 60 degrees above the horizon then, to the east of my WI QTH.

I also remember talking to Joe barefoot while driving home from work one morning, but I can't find it in my log. I do remember that he had to fight to hear me and that I checked the satellite's position when I got home and it was over Michigan at the time.

An article in the AMSAT magazine last year tells how a guy has made many contacts from his mobile. I can't remember what power he was using, but I remember that he bent his whip back at an angle to help elevate his signal.

A columnist in 73 magazine made a QSO with a guy in Cleveland using an HT once, too. He said he held it over the roof of a Volkswagon to use it as a reflector.

Anyway, it _can_ be done, but it's not easy.

N9LTD

654. Re: SAREX and Baycom ?

Newsgroup: rec.radio.amateur.space
Date: 1994-04-29 07:34:53 UTC
From: so-patu@stekt14.oulu.fi
Message-ID: <SO-PATU.94Apr29103453@stekt14.oulu.fi>
Source record: 27807

I had similar problems...i think the reason is that the baycom
software cannot understand the "UA,S" -packet sent by shuttle.

I didnt try GP+TFPCX, because it doesnt decode noisy signal as
well as baycom does, instead i tried working with normal TNC-
no problems...

Timo

Timo Patana Phone : +358-81-344947
OH6NVG Mobile : 940-4968276

655. * SpaceNews 25-Apr-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-04-29 16:48:31 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0425.1994@ampr.org>
Source record: 27808
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0425
* SpaceNews 25-Apr-94 *

BID: $SPC0425

=========
SpaceNews
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MONDAY APRIL 25, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* AMSAT-UK COLLOQUIUM NEWS *
============================
AMSAT-UK Colloquium Call for Papers

The ninth AMSAT-UK Colloquium will be held July 28, 29, 30 & 31 at the University of Surrey in Guildford, Surrey (England). This year's colloquium will be divided into four primary topic areas: Spacecraft Engineering, Future Space Missions, Groundstation and Spacecraft Operations and Associated Amateur Space Activities. Papers falling into these categories are sought for the event. Authors should submit abstracts to arrive no later than May 10, 1994 for consideration for this year's event. Papers accepted for this year's proceedings will be required in final form (camera ready or on disk) no later than June 10, 1994. Authors will be notified of paper acceptance by June 1.

Abstracts should be sent to:

Doug Loughmiller, G0SYX
AMSAT-UK Colloquium Programme Chairman
University of Surrey
Centre for Satellite Engineering Research
Guildford, Surrey
GU2 5XH
England

Submissions can also be made to the programme chairman via fax on +44 0483 259503 or via the Internet to: D.Loughmiller@ee.surrey.ac.uk. Abstracts and papers should only be sent to the addresses listed above.

The annual AMSAT-UK Colloquium is the largest international gathering of amateur satellite enthusiasts and experts in the world and has established a high standard of quality presentations on topics relevant to the amateur

satellite community. Organizers of this year's event would welcome all contributions of program material covering the vast scope of the amateur satellite program as it exists in 1994. The ninth AMSAT-UK colloquium promises to be the most informative and entertaining event yet. We look forward to your participation in this year's Colloquium.

[Info via F6CDD]

* SAREX NEWS *
==========
The following message from the STS-59 crew was received via SAREX by Dave, N6JLH in California:

We used the SAREX rig today to talk with 2 of our astronauts now stationed in Star CIty, near Moscow, and 2 cosmonauts. One of the astronauts was my friend and former STS-37 crewmate, Ken Cameron, R3/KB5AWP. Ken also got me into ham radio. It was terrific to hear his voice after several months corresponding by e-mail only! Linda, N5RAX and I and crewmate Kevin Chilton spoke to Ken and the cosmonauts including U6MIR, Anatoli Artsibartski, on two succesive orbits. What a great way to use ham radio!
They were standing near the Yuri Gagarin statue, using an HT with a 5/8 whip, standing on a car to increase their elevation!

73, Jay N5QWL 01:10 UTC 17 April 1994

* VE7BQH MAKES DXCC ON 144 MHZ *
==========
Heartiest congratulations to Lionel Edwards, VE7BQH, on becoming the fourth radio amateur to receive a DXCC award for 144 MHz, reported in May QST. What's more, Lionel did it with an antenna having forward gain of approximately 23.7 dBd, about 5 dB smaller than that of anyone else to have reached this exalted level of VHF DXing (so far, W5UN, KB8RQ and SM7BAE). The 336-element collinear array at VE7BQH is rotatable in the Z axis (polarization) as well as the normal X and Y axes (azimuth and elevation), which accounts for some of Lionel's outstanding results; his own operating ability, dedication and persistence over many years obviously contributed as well.

VE7BQH is perhaps best known as the ever-patient, ever-helpful net control station, premier technical advisor and chief schedule-arranger of the 2-meter EME Net, which meets each Saturday and Sunday on 14.345 MHz, a role he has filled without peer for many years. It's fair to say that without Lionel, 144 MHz EME would not have become anything like what it is today, and none of those using the mode could possibly have accomplished even a fraction of what they have done so far.

Congratulations, Lionel, thanks for everything and please keep up the great work you're doing for all of us!

[Info via Ray Soifer, W2RS]

* GARC WORLD WIDE WEB SERVER NEWS *
==========
The NASA Goddard Amateur Radio Club, Inc. in Greenbelt, Maryland has been working behind the scenes on projects that may benefit all amateur radio operators in general and perhaps AMSAT members in particular.

Astronaut Ron Parise, WA4SIR, has been beta testing a BBS which is accessible via the Internet through telnet and ftp, telephone modem, and packet radio (locally on 145.090 MHz and nonlocally through "packet wormholes"). With Ron's heavy STS-67 crew training as of late, Jim Blackwell N3KWU is picking up much of the work to complete the beta phase.

The BBS contains Keplerian orbital elements updated daily, AMSAT bulletins, SAREX bulletins, club member mail service, club announcements, space shuttle mission info and lots more.

Access via Internet: wa3nan.gsfc.nasa.gov or 128.183.105.17
via landline: 301-286-4137
via packet: see above parenthetical

Additionally, the Goddard Amateur Radio Club has a home page for public viewing on the GARC World Wide Web server. It contains the latest GARC Newsletter in electronic form, latest space shuttle keps, GARC calendar of events, details of upcoming club activities, current WA3NAN QSL card, club facility-repeater-BBS info, a morse code experiment and more.

WWW access URL:
http://macgwy-mac2.gsfc.nasa.gov/garc/wa3nan-home-page.html

The GARC Web server was developed and is maintained by club president Jim Blackwell N3KWU (n3kwu@amsat.org). You are invited to check out its potential. This medium is the hottest item on the Internet today.

73, Pat WD8LAQ Internet: wd8laq@amsat.org
Work URL: http://epims1.gsfc.nasa.gov/nppo/nppo.html

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

AJ1R KS2D KE4CIL KD6RGW G7MZY

...and Terry Stader, KA8SCP, the America Online Ham Radio Club Host, who makes SpaceNews bulletins available in the Ham Radio Club's Space Radio News Library on America Online. According to Terry, SpaceNews is downloaded quite frequently.

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA

INTERNET : kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

656. Re: Looking for the Satelite FAQ

Newsgroup: rec.radio.amateur.space
Date: 1994-04-29 17:18:52 UTC
From: magliaco@pilot.njin.net
Message-ID: <Apr.29.13.18.51.1994.29285@pilot.njin.net>
Source record: 27809

The Satellite FAQ file can be accessed via FTP st pilot.njin.net. It's
located under the pub/SpaceNews/information subdirectory. BTW, I'll be
adding for neat stuff when I get the chance. 8-)

73, de John, KD2BD
--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

657. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-05-01 03:00:07 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_767761206@ve6mgs.ampr.org>
Source record: 27810
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

```
Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
```

a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

--
Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

658. Re: SAREX and Baycom ?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-01 09:21:57 UTC
From: da884@cleveland.Freenet.Edu
Message-ID: <2pvsbl$jql@usenet.INS.CWRU.Edu>
Source record: 27511

I haven't tried SAREX, but just this week I had two connects with MIR
from my condo, just stick the magmount out the window, I'm on the second
floor of a 30 floor condo, and using my HT and 5 watts hit the thing, but
started to get drowned out by the biger stations. Not bad. I also heard
packet on AO-21 got a few from RUDAK on the downlink freq.

--

```
_____________________________________________________________________________
| David AMPRnet - ve3tos@ve3tos.ampr.org www |
|Don Mills, Ontario Internet - da884@cleveland.freenet.edu (o o) |
|_Canada____VE3TOS_____Packet - ve3tos@va3bbs.#scon.on.can.noam_oOO__(_)__OOo|
```

659. ARLK017 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-05-01 20:31:10 UTC
From: mtracy@arrl.org
Message-ID: <$arlk017.1994@ampr.org>
Source record: 27512
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK017
ARLK017 Keplerian data

ZCZC SK84
QST de W1AW
Keplerian Bulletin 17 ARLK017
>From ARRL Headquarters
Newington, CT April 30, 1994
To all radio amateurs

SB KEP ARL ARLK017
ARLK017 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94189.76632148 0.00073311 21920-3 0 22
2 99965 28.4664 14.3253 0003598 331.2635 28.7780 15.90320458 27
AO-10
1 14129U 83058B 94114.79345608 -.00000048 10000-3 0 2755
2 14129 27.1659 330.6978 6021287 173.0169 202.1666 2.05879661 53711
RS-10/11
1 18129U 87054A 94112.22132617 0.00000050 37961-4 0 8911
2 18129 82.9282 10.2138 0010922 172.2691 187.8635 13.72335446342231
UO-11
1 14781U 84021B 94113.06431880 0.00000278 55048-4 0 6836
2 14781 97.7895 130.3678 0013036 84.7630 275.5059 14.69195303542215
RS-12/13
1 21089U 91007A 94112.31270038 0.00000064 52634-4 0 6819
2 21089 82.9206 52.8817 0027696 265.2661 94.5331 13.74039371160974
AO-13
1 19216U 88051B 94114.36934900 -.00000468 10000-4 0 9054
2 19216 57.8413 256.1944 7213809 339.7848 2.0604 2.09724652 13386
UO-14
1 20437U 90005B 94116.16170146 0.00000051 36689-4 0 9831
2 20437 98.5906 201.6413 0011286 349.0529 11.0406 14.29838925222157
AO-16
1 20439U 90005D 94115.23960657 0.00000069 43835-4 0 7832
2 20439 98.5995 201.9099 0011471 352.2333 7.8667 14.29892998222034
```

```
DO-17
1 20440U 90005E 94114.77929281 0.00000071 44507-4 0 7829
2 20440 98.5998 201.7595 0011671 352.9789 7.1226 14.30032337221984
WO-18
1 20441U 90005F 94116.15306089 0.00000039 31960-4 0 7844
2 20441 98.6000 203.1217 0012332 349.0264 11.0649 14.30007044222180
LO-19
1 20442U 90005G 94116.20468368 0.00000045 34184-4 0 7826
2 20442 98.6010 203.4180 0012608 348.5305 11.5588 14.30102401222203
FO-20
1 20480U 90013C 94115.89949664 -.00000029 -17513-5 0 6780
2 20480 99.0305 277.6217 0541342 97.9044 268.3828 12.83225244197429
AO-21
1 21087U 91006A 94113.22040654 0.00000093 82657-4 0 4566
2 21087 82.9431 183.3804 0033605 236.5859 123.2046 13.74538443162031
UO-22
1 21575U 91050B 94113.75195676 0.00000054 32738-4 0 4843
2 21575 98.4379 189.3404 0008632 89.7354 270.4820 14.36909021145262
KO-23
1 22077U 92052B 94114.82482848 -.00000037 10000-3 0 3795
2 22077 66.0866 31.7104 0012945 300.7194 59.2539 12.86285454 79928
KO-25
1 22830U 93061H 94115.18825605 0.00000044 35104-4 0 2839
2 22830 98.5581 189.3658 0011523 337.3419 22.7254 14.28048513 30130
IO-26
1 22826U 93061D 94112.22229648 0.00000033 31343-4 0 2795
2 22826 98.6575 188.6151 0009827 19.0306 341.1242 14.27722396 29705
AO-27
1 22825U 93061C 94112.23722954 0.00000045 36103-4 0 2795
2 22825 98.6575 188.6003 0009396 17.0892 343.0602 14.27619258 29702
PO-28
1 22829U 93061G 94115.75302146 0.00000058 41154-4 0 2736
2 22829 98.6532 192.1296 0010520 355.3289 4.7790 14.28020523 30211
Mir
1 16609U 86017A 94115.38474228 0.00005080 70849-4 0 5802
2 16609 51.6453 90.7982 0014698 181.8777 178.2164 15.58767651467816

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
May 3, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

660. PB Error Messages - Meaning and How to Respond/Correct?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-02 10:53:33 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.112.767876012@UPEI.CA>
Source record: 27513

This weekend I had two excellant passes of KO-23. During both passes the following Error Messages occured repeatedly:

Out of Memory

Error Allocating hole to init file

What are the meanings of these two messages and what are the most likely causes? I was not able to find the information in the PB documents.

The setup is a DSP2232 serially connected to a 486 SX (20 MHz) at 19200 . The software is running in DOS and there is only one TSR in memory (loaded high) - an evaluation copy of rightime - to keep the computer time accurate. I am using the serial monitoring capability of Rightime so that it does not interfere with the operations of PB.

I did reboot the computer each pass and in one instance the error messages re-occured and in the other they only appeared once and then PB settled down.

Any suggestions or comments would be welcome.

73 Dave Seeler VY2DCS
Internet: Seeler@upei.ca

661. Wanted: Kansas City Tracker/Tuner or similiar device

Newsgroup: rec.radio.amateur.space
Date: 1994-05-02 14:30:46 UTC
From: debaker@bnr.ca
Message-ID: <2q32qm$ptq@crchh7b0.bnr.ca>
Source record: 27514
Cross-posted to: rec.radio.amateur.equipment,rec.radio.amateur.space,rec.radio.swap

```
Hello,

I am looking for information about the Kansas City Tracker/Tuner or
any similiar device. If you know where to get these, or have one for
sale, please send email.

Thanks,
+---------------------------------------------------------------------+
| David E. Baker Internet: debaker@bnr.ca (Richardson, TX, USA) |
| Callsign: AB5PI Amateur Packet: AB5PI@N5AUX.#DFW.TX.USA.NA |
| My opinions do not necessarily reflect the opinions of my employer |
+---------------------------------------------------------------------+
```

662. Pre-amp recommendations wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-05-02 16:13:23 UTC
From: debaker@bnr.ca
Message-ID: <2q38r3$q9@crchh7b0.bnr.ca>
Source record: 27515

Greetings,

I am looking for recommendations (and used items if you have them) for pre-amps for 145 and 435MHz. I have looked at units made by ARR, SSB, and Mirage/KLM. So far, the Mirage/KLM KP-2 series looks like the best price/performance package.

Thanks,

+---+
| David E. Baker Internet: debaker@bnr.ca (Richardson, TX, USA) |
| Callsign: AB5PI Amateur Packet: AB5PI@N5AUX.#DFW.TX.USA.NA |
| My opinions do not necessarily reflect the opinions of my employer |
+---+

663. KD2BD's Orbital Prediction Software Available Via FTP

Newsgroup: rec.radio.amateur.space
Date: 1994-05-02 17:22:39 UTC
From: magliaco@pilot.njin.net
Message-ID: <May.2.13.22.38.1994.6255@pilot.njin.net>
Source record: 27516
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

I just uploaded by satellite orbital prediction software to pilot.njin.net.
It's called "predict.zip" and is located under the /pub/SpaceNews/software
subdirectory.

Enjoy!

73, de John, KD2BD
--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

664. * SpaceNews 02-May-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-05-02 18:09:56 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0502.1994@ampr.org>
Source record: 27518
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0502
* SpaceNews 02-May-94 *

BID: $SPC0502

=========
SpaceNews
=========

MONDAY MAY 2, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* AO-27 OPERATING NOTES *
========================
AO-27 has had its FM transponder in operation on the weekends when the spacecraft is in sunlight. The transponder on AO-27 receives on an uplink frequency of 145.850 MHz FM, and downlinks on 436.800 MHz FM. As of yet, no official operating schedule has been announced, but that hasn't stopped amateur experimenters from communicating with others through the satellite.

As an example, John, N8QGC, has been working stations on AO-27 all the way from his Detroit area QTH to as far away as Mexico City, Mexico, Baffin Island, and the North West Territories. N8QGC usually works AO-27 from a mobile station using 10 watts of transmitter power from his Kenwood TM-731A and a homebrew 1/4 wave antenna. Even with his low power and small antenna system, John has no problem securing a strong signal into the satellite. He has even tried accessing the satellite with his ICOM IC-U2AT running 2.5 watts and a rubber duck antenna and also had a good uplink signal (especially during periods when larger stations were not clobbering the satellite uplink with excessively strong signals). Due to the extreme sensitivity of this satellite, uplink ERP should be kept below 25 watts.

AO-27 control station Mark, N4TPY, has reported that the satellite has a transponder output power of between 2 and 3 watts at the present time, and as such, is nearly impossible to receive on a HT with a rubber duck. Omni-directional antennas have provided only limited results.

N8QGC uses a 6 element KLM 440-6X yagi rated at 8.9 dB gain to copy AO-27's downlink signals. He aims it out his car window and receives the satellite well. The doppler shift experienced when communicating through this satellite can be quite high. John usually starts listening for AO-27 at 436.805 MHz, and tracks it down to 436.790 MHz at LOS.

Santoyo V. Ramon, XE1KK, of Mexico City has reported hearing Spanish speaking stations through AO-27 with very strong signals. They are not hams, nor are they hearing the satellite downlink. He believes they are located in the Caribbean zone, probably Cuba or Puerto Rico, and have been heard talking about union elections. He is actively tracking down the source of these signals.

[Info via N8QGC, XE1KK, and ANS]

* KEPLERIAN DATA AVAILABLE *
==========
Up-to-date Keplerian data in the NASA 2-line format is available via the Internet at archive.afit.af.mil (129.92.1.66) using anonymous ftp. Files such as amateur.tle, glonass.tle, gorizont.tle, gps-ops.tle, gps.tle, tvro.tle, visual.tle, and weather.tle are located in the /pub/space subdirectory at this site.

* OSCAR-11 NEWS *
==========
The Digitalker has been activated on the UoSAT-OSCAR-11 satellite. UO-11 has an FM downlink on 145.826 MHz, and the voice messages are interspersed with telemetry and news bulletins sent at 1200 bps using AFSK modulation.

* MIR NEWS *
==========
James, G1HJH, of Shoreham by Sea, West Sussex, England provides the following listing of messages contained on the Mir Personal Message System on 18-Apr-94:

Msg # Stat Date Time To From @ BS Subject
2273 PR 04/17/94 10:34 ALL N6JLH MIR Keps 4-14 UTC
2272 P 04/16/94 11:33 R0MIR N7YRV Hi
2271 P 04/16/94 11:31 W6KZW WD6GYU Hello de Manton!
2270 P 04/16/94 10:59 VK3CFI VK3ZGL hello maggie
2269 P 04/16/94 09:58 N7QME N7TTQ hi hhere
2268 PR 04/16/94 09:57 R0MIR N7TTQ greetings from Tigard, OR
2267 P 04/15/94 23:05 R0MIR F1OKN ** DOBRI VIETCHERE **
2266 PR 04/15/94 14:18 R0MIR KB2MVN School Greetings
2265 P 04/15/94 14:10 R0MIR KD6CLO QSL CARD
2264 PR 04/15/94 12:44 ALL KB2MVN CALLING CQ.....
2265 P 04/18/94 01:05 R0MIR G1HJH HOPE ALL IS FINE
5449 Bytes free
Next message Number 2274

* OSCAR-13 SCHEDULE *
==========
The following is the latest AO-13 operating schedule:

M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF

Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11

[Info via G3RUH]

* FO-20 SCHEDULE *
==================
The Fuji-OSCAR-20 satellite will be operating in Mode JA between 11-May-94
at 06:54 UTC through 18-May-94 at 07:20 UTC. The packet mailbox is active
at other times.

[Info via Kazu Sakamoto, JJ1WTK]

* FEEDBACK/INPUT WELCOMED *
==========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

665. ANS-120 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-05-02 23:06:48 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-120.01.1994@ampr.org>
Source record: 27519
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-120.01
AO-13 OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 120.03 FROM AMSAT HQ
SILVER SPRING, MD APRIL 30, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-120.01

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS
09-May-94 0000 B 175 W5IU WA5ZIB
14-May-94 1700 B 167 WA5ZIB W5IU
21-May-94 2130 B 185 VE2LVC W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

Slow Scanners are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other SSTV skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-120.02
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 120.04 FROM AMSAT HQ
SILVER SPRING, MD APRIL 30, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-120.02

Weekly OSCAR Status Reports: 30-APR-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11

Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The following is the current schedule for transponder operations:
ANALOG MODE:
11-May-94 6:54 -to- 18-May-94 7:20 UTC
Digital mode: Unless otherwise noted above.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

KO-25: N7RYW has noticed that KO-25 started to become very difficult for him to uplink to. This began for him over a week ago. At first, he attributed the difficulty to the nearness of AO-21. This week he noticed that AO-21 was far out of sight of KO-25, and yet the trouble remained. N7RYW does not belive that his keps for AO-21 are off and thus he feels there might be something bothering KO-25's receiver. He is wondering if the receiver was switched to the secondary frequency. If so, it may be hard to find, as it was when KO-25 was first activated. In that instance, it was found to be off from its published frequency. N7RWY will be testing various uplinks over the next few days to see if he can find where its secondary uplink frequency is located. If there any other KO-25 users have had problems, please send N7RYW a note at his INTERNET address of n7ryw@teleport.com. In a further status report received from WH6I, he also notes that KO-25 has been deaf with many stations thinking that AO-21 was the cause of the desensing of KO-25's reciever. However, analysis of the telemetry and many "re-tries" by some stations with a lot of power seems to indicate that desense is not the problem. In fact KO-25 has been deaf even when AO-21 is not near it. At the moment it seems that there might be a software problem, or perhaps the receiver is on a different (unknown) frequency. [N7RYW & WH6I]

AO-16: Working well. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Operating Normally. [WH6I]

RS-10/11: Operating normally with very strong signals. [ZS6AOP]

MIR: N0XCZ reports that MIR's Personal Bulletin Board System (PBBS) is quite active but it appears to be running with low power. Stations can be heard but with weak signals. The MIR PBBS can be heard and worked on a frequency of 145.550 MHz, FM, simplex. [N0XCZ]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on

INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

666. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-05-03 00:51:35 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.767926295@afit.af.mil>
Source record: 27520
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.info on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (also updated daily) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a eleven-character name.

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

667. Two-Line Orbital Element Sets (TLE386)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-03 00:54:07 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.767926447@afit.af.mil>
Source record: 27517

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #386 -
Alouette 1
1 00424U 62049 94120.06929873 .00000090 00000-0 95258-4 0 9870
2 00424 80.4647 332.4836 0022232 238.8288 121.0678 13.67807932575828
ATS 1
1 02608U 66110A 94120.61102241 -.00000232 00000-0 10000-3 0 8668
2 02608 14.5382 0.8986 0009990 34.9546 311.8941 1.00391110 16987
ATS 3
1 03029U 67111A 94117.25033784 -.00000126 00000-0 10000-3 0 1822
2 03029 14.6262 8.0052 0010086 270.9886 280.8274 1.00273177 96922
Cosmos 398
1 04966U 71016A 94122.14085983 .00084157 64677-5 17469-3 0 1730
2 04966 51.4520 149.7335 1061780 228.2752 122.2260 13.79868124766370
Starlette
1 07646U 75010A 94120.28791417 -.00000128 00000-0 11036-4 0 7749
2 07646 49.8261 342.3721 0206229 178.0422 182.1341 13.82185894971222
LAGEOS
1 08820U 76039A 94122.06759860 .00000025 00000-0 10000-3 0 9870
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2 09852 12.0278 42.3644 0002272 355.1437 113.0291 0.99996307 9941
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2 10893 63.5738 285.9879 0213851 13.9551 346.5991 2.01627337117093
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2 10953 10.0554 49.0350 0003684 81.1228 52.9859 1.00270247 11259
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2 11054 63.2626 283.1218 0043748 175.6652 184.3465 1.93505207113616
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2 11080 99.0611 4.6599 0008357 266.3952 93.6247 13.83734525783300
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2 11141 64.6179 48.2076 0048555 24.8775 335.3375 1.92894828 2776
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LandSat 4
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Cosmos 1447
1 13916U 83021A 94121.30863490 .00000030 00000-0 15362-4 0 3868
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LandSat 5
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Kvant-1
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RS-10/11
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2 18312 82.5525 250.5730 0010843 250.0884 109.9102 13.84028156338306
Meteor 2-17
1 18820U 88005A 94120.04285105 .00000048 00000-0 29427-4 0 2826
2 18820 82.5394 306.8872 0016313 321.6169 38.3825 13.84714562315692
DMSP B5D2-4
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2 18822 98.4498 330.2427 0006701 135.6784 224.4934 14.22944578322678
Glonass 34
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2 19163 65.0196 112.0886 0007373 168.4496 191.5609 2.13102345 45611
Glonass 36
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2 19165 65.0034 112.0138 0004157 322.4589 37.5258 2.13102208 46254
METEOSAT 3
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AO-13
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2 19216 57.8413 256.1944 7213809 339.7848 2.0604 2.09724652 13386
OKEAN 1
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Meteor 3-2
1 19336U 88064A 94119.16098032 .00000051 00000-0 10000-3 0 2792
2 19336 82.5441 358.3815 0018456 28.3798 331.8328 13.16966746276802
Glonass 39
1 19503U 88085C 94115.94436481 -.00000039 00000-0 10000-3 0 1748
2 19503 65.7500 351.0845 0007610 172.6791 187.3788 2.13102058 43658
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TDRS 2
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1 19749U 89001A 94117.39155955 .00000048 00000-0 10000-3 0 3846
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Glonass 41
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2 19750 64.9677 111.8291 0006077 261.5013 98.4159 2.13101899 41188
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Akebono
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MOP-1
1 19876U 89020B 94117.21551330 -.00000085 00000-0 00000+0 0 198
2 19876 0.3488 60.6471 0001242 353.7473 229.6827 1.00274388 6556
TDRS 3
1 19883U 89021B 94119.19077463 -.00000283 00000-0 00000+0 0 9072
2 19883 0.0640 69.1339 0001850 283.7774 251.6993 1.00274937 88974
GPS BII-02
1 20061U 89044A 94119.21026708 -.00000069 00000-0 10000-3 0 9174
2 20061 54.6826 318.4489 0127554 207.6759 151.6536 2.00565564 35816
Nadezhda 1
1 20103U 89050A 94121.98035551 .00000038 00000-0 24326-4 0 9858
2 20103 82.9592 321.8410 0039297 58.5743 301.9247 13.73837629241961
GPS BII-03
1 20185U 89064A 94120.54358984 .00000030 00000-0 10000-3 0 9059
2 20185 54.9326 142.2541 0010503 265.0378 94.8860 2.00573588 34411
GMS 4
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2 20217 0.0671 337.0119 0007965 151.5413 327.0158 1.00268326 17416
GPS BII-04
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Meteor 3-3
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Kvant-2
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SPOT 2
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2 20436 98.7190 195.4086 0001383 47.2755 312.8531 14.20035607221296
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Glonass 45
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1 20788U 90081A 94122.06373390 .00000252 00000-0 19534-3 0 9558
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DMSP B5D2-5
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Glonass 49
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AO-21
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RS-12/13
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2 21263 98.6211 147.8073 0013658 23.2120 336.9673 14.22397161153536
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2 21578 98.4485 196.6054 0006116 81.1026 279.0846 14.38751136146091
TDRS 4
1 21639U 91054B 94117.61125251 .00000070 00000-0 10000-3 0 7174
2 21639 0.0661 52.1081 0003440 52.4153 156.6349 1.00277204 8065
Meteor 3-5
1 21655U 91056A 94122.08926319 .00000051 00000-0 10000-3 0 6982
```

```
2 21655 82.5547 149.3035 0012838 319.1556 40.8589 13.16830191130392
UARS
1 21701U 91063B 94122.15347693 .00003650 00000-0 33989-3 0 5137
2 21701 56.9877 343.5416 0005118 90.2579 269.9042 14.96456525144040
DMSP B5D2-6
1 21798U 91082A 94121.38189642 .00000112 00000-0 83015-4 0 3499
2 21798 98.9639 127.1248 0011779 273.2758 86.7066 14.13791302125009
Glonass 53
1 21853U 92005A 94117.91519483 .00000045 00000-0 10000-3 0 8854
2 21853 64.8974 110.7984 0009074 186.1230 173.8618 2.13102499 17474
Glonass 54
1 21854U 92005B 94119.61528417 .00000048 00000-0 00000+0 0 9502
2 21854 64.8933 110.7264 0016639 7.8006 352.2126 2.13102761 17497
Glonass 55
1 21855U 92005C 94120.61486982 .00000055 00000-0 00000+0 0 9547
2 21855 64.8914 110.6975 0007586 219.7551 140.1831 2.13101779 17502
JERS-1
1 21867U 92007A 94121.74801677 .00000964 00000-0 85127-4 0 2976
2 21867 97.6442 197.4637 0001779 129.1899 230.8188 14.98656595121426
GPS BIIA-12
1 21890U 92009A 94119.40876313 -.00000030 00000-0 10000-3 0 5024
2 21890 54.1556 258.7733 0057126 164.9628 195.1769 2.00572280 16001
GPS BIIA-13
1 21930U 92019A 94119.11958960 -.00000082 00000-0 10000-3 0 4810
2 21930 55.5767 19.7994 0053141 169.7160 190.4318 2.00564320 14929
EUVE
1 21987U 92031A 94118.06876649 .00001724 00000-0 71788-4 0 2904
2 21987 28.4364 30.0430 0010153 147.4588 212.6625 15.18465137104777
SAMPEX
1 22012U 92038A 94119.76831623 .00001103 00000-0 95362-4 0 5102
2 22012 81.6711 221.9350 0118845 196.8207 162.9054 14.90961937 99065
GPS BIIA-14
1 22014U 92039A 94120.14815807 -.00000015 00000-0 10000-3 0 3953
2 22014 54.9122 199.6602 0055452 312.7372 46.7119 2.00564557 6786
Glonass 56
1 22056U 92047A 94120.04631263 -.00000068 00000-0 00000+0 0 8520
2 22056 64.9233 350.5757 0004221 289.3980 70.6059 2.13103283 13581
Glonass 57
1 22057U 92047B 94120.80966764 -.00000071 00000-0 00000+0 0 8582
2 22057 64.9360 350.5602 0007834 329.9639 30.0374 2.13102508 13575
Glonass 58
1 22058U 92047C 94120.28122945 -.00000069 00000-0 00000+0 0 8677
2 22058 64.9371 350.5840 0009398 286.6688 73.2767 2.13102740 13610
TOPEX
1 22076U 92052A 94122.20887797 -.00000038 00000-0 10000-3 0 7513
2 22076 66.0444 26.5025 0007619 266.2389 93.7756 12.80931139 80600
KO-23
1 22077U 92052B 94119.10113656 -.00000037 00000-0 10000-3 0 3802
2 22077 66.0857 22.7578 0013062 300.2441 59.7282 12.86285570 80475
S80/T
```

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1 22078U 92052C 94120.20812376 -.00000037 00000-0 10000-3 0 3799
2 22078 66.0849 19.7715 0014983 302.8603 57.0973 12.86567262 80689
GPS BIIA-15
1 22108U 92058A 94121.61015138 -.00000043 00000-0 10000-3 0 3939
2 22108 54.3698 259.3659 0110509 137.3230 223.5075 2.00552795 11993
FREJA
1 22161U 92064A 94121.23880437 .00000069 00000-0 79929-4 0 3949
2 22161 63.0065 51.4617 0781991 311.0375 42.5520 13.21757788 75596
LAGEOS II
1 22195U 92070B 94119.17219656 -.00000009 00000-0 10000-3 0 2849
2 22195 52.6382 124.6542 0138824 95.9842 265.6568 6.47294257 35770
GPS BIIA-16
1 22231U 92079A 94120.30252704 -.00000018 00000-0 10000-3 0 3905
2 22231 54.7264 200.8909 0035335 292.7248 66.8986 2.00558696 10545
GPS BIIA-17
1 22275U 92089A 94120.44585226 -.00000018 00000-0 10000-3 0 3974
2 22275 54.6573 198.4218 0051992 254.1406 105.3756 2.00560081 9953
TDRS 5
1 22314U 93003B 94114.41236729 -.00000285 00000-0 10000-3 0 3882
2 22314 0.9802 72.8491 0002553 310.7947 291.4318 1.00269693 4783
GPS BIIA-18
1 22446U 93007A 94119.52132310 -.00000070 00000-0 10000-3 0 3905
2 22446 54.6951 319.2933 0074938 344.0979 15.6762 2.00575678 8923
Glonass 59
1 22512U 93010A 94119.79307023 .00000049 00000-0 00000+0 0 5617
2 22512 64.9069 110.5703 0009263 209.5598 150.3804 2.13101941 9083
Glonass 60
1 22513U 93010B 94119.73338646 .00000048 00000-0 00000+0 0 5717
2 22513 64.9001 110.5896 0007319 213.6505 146.2953 2.13102453 9276
Glonass 61
1 22514U 93010C 94119.96930079 .00000050 00000-0 00000+0 0 5578
2 22514 64.9090 110.5696 0013465 201.2075 158.7295 2.13100856 9280
ASTRO-D
1 22521U 93011A 94121.03171681 .00000877 00000-0 70161-4 0 2837
2 22521 31.1036 12.1158 0076340 351.3963 8.5375 14.93156440 65046
UFO F1
1 22563U 93015A 94120.62194181 -.00000020 00000-0 10000-3 0 2781
2 22563 26.7316 300.4763 0003510 7.0015 216.4137 0.99247373 8365
GPS BIIA-19
1 22581U 93017A 94115.17307353 -.00000072 00000-0 10000-3 0 2905
2 22581 55.0925 19.7164 0048588 33.4494 326.8780 2.00570140 7891
ARSENE
1 22654U 93031B 94117.21043337 -.00000111 00000-0 00000+0 0 2503
2 22654 1.7570 101.6753 2923548 179.5215 181.7522 1.42202344 476
GPS BIIA-20
1 22657U 93032A 94119.79515146 -.00000087 00000-0 10000-3 0 2949
2 22657 55.1131 19.3537 0059123 206.7549 152.9268 2.00559125 3310
RADCAL
1 22698U 93041A 94120.04106967 .00000089 00000-0 33864-4 0 2878
2 22698 89.5464 311.8803 0092064 345.7975 14.0627 14.21308050 43753
```

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GPS BIIA-21
1 22700U 93042A 94119.25819824 -.00000029 00000-0 10000-3 0 2856
2 22700 54.5557 260.1956 0025626 321.6954 38.0702 2.00574651 6101
NOAA 13
1 22739U 93050A 94118.85889751 .00000031 00000-0 42160-4 0 4215
2 22739 98.9443 63.4516 0009016 263.1020 96.9123 14.10893597 37004
GPS BIIA-22
1 22779U 93054A 94119.85082172 -.00000070 00000-0 10000-3 0 3126
2 22779 54.8323 319.2006 0022163 223.4708 136.3640 2.00570145 4871
Meteor 2-21
1 22782U 93055A 94119.82283343 .00000041 00000-0 24056-4 0 2922
2 22782 82.5458 244.7507 0022841 5.4637 354.6767 13.83004534 33405
UFO F2
1 22787U 93056A 94119.74573311 -.00000094 00000-0 10000-3 0 2737
2 22787 4.8760 323.3924 0006135 354.2731 240.5443 1.00274427 761
SPOT 3
1 22823U 93061A 94120.23833302 .00000169 00000-0 10000-3 0 2944
2 22823 98.7145 195.4388 0000809 76.1404 283.9858 14.20039444 30681
STELLA
1 22824U 93061B 94122.19675705 -.00000029 00000-0 60716-5 0 2816
2 22824 98.6554 198.3729 0006804 351.3388 8.7679 14.27096443 31118
AO-27
1 22825U 93061C 94121.20829173 .00000061 00000-0 42616-4 0 2811
2 22825 98.6565 197.4833 0009082 352.4372 7.6673 14.27620742 30984
IO-26
1 22826U 93061D 94120.70214003 .00000021 00000-0 26462-4 0 2813
2 22826 98.6560 197.0112 0009659 355.1952 4.9126 14.27723732 30919
HEATHSAT
1 22827U 93061E 94119.70534288 .00000043 00000-0 35140-4 0 3438
2 22827 98.6544 195.9991 0009788 345.4559 14.6330 14.27832479 30770
PO-28
1 22829U 93061G 94120.16722791 .00000043 00000-0 35038-4 0 2749
2 22829 98.6528 196.5018 0010253 342.8173 17.2668 14.28021059 30849
KO-25
1 22830U 93061H 94119.74251263 .00000039 00000-0 33232-4 0 2844
2 22830 98.5578 193.8277 0011299 323.5993 36.4420 14.28049271 30787
GPS BIIA-23
1 22877U 93068A 94118.40924732 -.00000009 00000-0 10000-3 0 1059
2 22877 55.1814 80.4338 0032530 286.1878 73.4225 2.00580798 3736
METEOSAT 6
1 22912U 93073B 94115.00000000 -.00000099 00000-0 00000+0 0 773
2 22912 1.0335 359.9992 0000611 174.6522 28.0102 1.00262257 09
HST Array
1 22920U 90037C 94121.24983904 .00005544 00000-0 46457-3 0 1292
2 22920 28.4715 170.9716 0004616 134.6803 225.3959 14.96369280 22453
Soyuz TM-18
1 22957U 94001A 94121.92387232 -.00001508 00000-0 -12428-4 0 1069
2 22957 51.6458 57.9807 0014191 207.4788 152.6046 15.58829675 17754
Meteor 3-6
1 22969U 94003A 94119.37840139 -.00000265 00000-0 -72370-3 0 531
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2 22969 82.5573 90.6951 0016543 30.6839 329.5217 13.16719147 12426
TUBSAT-B
1 22970U 94003B 94120.43475370 -.00000252 00000-0 -68749-3 0 422
2 22970 82.5423 89.9254 0017511 25.5730 334.6258 13.16817087 12567
1994004C
1 22987U 94004C 94098.46584220 -.00000666 00000-0 00000+0 0 74
2 22987 66.5360 59.3960 9045772 202.2990 31.7820 0.46869300 14
ODERACS A
1 22990U 94006B 94121.19725788 .00045911 00000-0 20143-3 0 584
2 22990 56.9898 182.6412 0024031 69.0340 291.2770 15.83805059 12718
ODERACS B
1 22991U 94006C 94121.34524708 .00042417 00000-0 19097-3 0 596
2 22991 56.9847 182.1936 0021688 68.6896 291.5736 15.83381493 12733
ODERACS E
1 22994U 94006F 94121.34910608 .00020016 00000-0 11447-3 0 555
2 22994 56.9898 183.5680 0022245 77.2675 283.0864 15.78616230 12714
ODERACS F
1 22995U 94006G 94121.22435962 .00020679 00000-0 11815-3 0 631
2 22995 56.9914 184.1576 0021186 75.3871 284.9371 15.78646309 12695
BREMSAT
1 22998U 94006H 94121.34274244 .00021787 00000-0 12988-3 0 476
2 22998 56.9939 184.2275 0018059 85.4617 274.8388 15.77744472 12557
GPS BIIA-24
1 23027U 94016A 94118.98122565 -.00000081 00000-0 00000+0 0 355
2 23027 54.9377 21.4850 0062448 190.0120 169.8944 2.00556088 1059
SEDS 2
1 23028U 94016B 94122.37392687 .01274233 94516-3 15473-2 0 654
2 23028 32.3475 339.4760 0008802 318.7690 41.8255 16.07126792 8436
ProgressM22
1 23035U 94019A 94121.92387232 -.00001508 00000-0 -12428-4 0 470
2 23035 51.6458 57.9807 0014191 207.4788 152.6046 15.58829675 6378
Cosmos 2275
1 23043U 94021A 94119.16492384 -.00000064 00000-0 00000+0 0 338
2 23043 64.8127 351.0768 0004658 191.7494 168.2658 2.13134681 386
Cosmos 2276
1 23044U 94021B 94120.92669355 -.00000072 00000-0 00000+0 0 215
2 23044 64.8002 351.0143 0027585 201.6118 158.4568 2.13093421 426
Cosmos 2277
1 23045U 94021C 94117.28923369 -.00000050 00000-0 00000+0 0 226
2 23045 64.8119 351.1518 0006829 198.1964 161.8239 2.13119617 340
1994021F
1 23048U 94021F 94121.96269222 -.00000074 00000-0 00000+0 0 169
2 23048 64.8020 350.9809 0006650 250.1688 109.7976 2.13314878 365
1994021G
1 23049U 94021G 94119.57601312 -.00000022 00000-0 66520-4 0 150
2 23049 64.8037 344.9570 5802294 296.6185 16.1135 4.23184498 681
1994021H
1 23050U 94021H 94121.70186956 -.00000274 00000-0 -19592-3 0 170
2 23050 64.8758 344.0560 5802536 296.5451 16.1214 4.23201373 777
GOES 8
```

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1 23051U 94022A 94121.25526109 -.00000276 00000-0 00000+0 0 845
2 23051 0.4571 268.8368 0107930 45.5114 265.0783 1.00428296 48
1994022B
1 23052U 94022 B 94118.14973816 .00061673 00000-0 28736-2 0 184
2 23052 026.9371 107.9184 7603625 186.3186 149.9875 01.92086422000281
Cosmos 2278
1 23087U 94023A 94119.77554305 -.00005348 00000-0 -28903-2 0 74
2 23087 71.0040 4.8278 0004197 56.3933 304.1023 14.12119673 911
1994023B
1 23088U 94023B 94120.12171530 -.00000086 00000-0 -20415-4 0 145
2 23088 71.0059 4.0489 0004883 300.0037 60.0600 14.13779298 975
1994023C
1 23089U 94023C 94121.05942663 -.00000391 00000-0 -33556-3 0 94
2 23089 71.0289 3.4771 0200761 86.1494 276.2568 13.71646408 1086
1994023D
1 23090U 94023D 94121.05132085 -.00000021 00000-0 19508-4 0 52
2 23090 71.0354 3.5489 0193177 61.8157 300.2313 13.73113924 1097
1994023E
1 23091U 94023E 94120.11381418 -.00000023 00000-0 17683-4 0 48
2 23091 70.9871 4.7964 0201931 87.0543 275.3664 13.71149699 959
Cosmos 2279
1 23092U 94024A 94117.46203209 .00000814 00000-0 83527-3 0 85
2 23092 82.9459 274.5126 0034187 285.6576 74.0800 13.74974402 194
1994024B
1 23093U 94024B 94121.09511278 -.00014108 00000-0 -14452-1 0 125
2 23093 82.9442 271.8181 0026914 271.9758 87.8312 13.76410732468615
1994023F
1 23094U 94023F 94119.74708996 -.00001122 00000-0 -10329-2 0 42
2 23094 70.9877 5.5601 0204072 60.3550 301.7714 13.71601201 903
1994025A
1 23095U 94025A 94121.70658565 .00083891 66473-5 13983-3 0 121
2 23095 70.3754 149.4843 0046196 104.9399 255.7775 16.00782127 485
1994025B
1 23096U 94025B 94122.28094090 .10962036 42214-5 53946-3 0 187
2 23096 70.3881 147.5238 0019259 67.9025 292.4481 16.40649986 580
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

668. Russian space station MIR

Newsgroup: rec.radio.amateur.space
Date: 1994-05-03 20:05:57 UTC
From: jbhertzb@unix.amherst.edu
Message-ID: <2q6ar5$4f9@amhux3.amherst.edu>
Source record: 27522

Can anyone tell me what MIR's uplink and downlink frequencies are, how often they are likely to transmit, and whether there are any hams aboard at this time?

Thanks.
-Jared Hertzberg N2YES
jbhertzb@amhux3.amherst.edu

669. Re: SatTrack

Newsgroup: rec.radio.amateur.space
Date: 1994-05-03 20:27:03 UTC
From: nancyhendr@aol.com
Message-ID: <2q6c2n$7it@search01.news.aol.com>
Source record: 27523

In article <1994Apr4.203441.4071@news.vanderbilt.edu>,
HEAGYWS@ctrvax.Vanderbilt.Edu () writes:

Win - I have the phone number for some BBS's that carry up to date Keplerian
elements - where are you located?

670. MIR station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-04 13:12:52 UTC
From: ce6fyn@ce6fyn.radio.CL
Message-ID: <85@ce6fyn.radio.cl>
Source record: 27525

Hi I'm interesting in contac with, MIR
anyone now what is the operating frecuency by packet or fone in
VHF.

please send msg: ce6fyn@ce6fyn.radio.cl

671. TEST

Newsgroup: rec.radio.amateur.space
Date: 1994-05-04 13:47:49 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-040594134927@129.26.163.253>
Source record: 27524

TEST, please ignore


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

672. Request information

Newsgroup: rec.radio.amateur.space
Date: 1994-05-05 21:03:51 UTC
From: ce6fyn@ce6fyn.radio.CL
Message-ID: <112@ce6fyn.radio.cl>
Source record: 27538

Hi, I read on space-news boletin, about AO-27 satellite, and I'm interesting to make a contact with the AO-27, but I don't no if it possible connect it in my zone (Chile South America). Please if anyone have more information about it, please send me a e-mail to ce6fyn@ce6fyn.radio.cl.

Thanks and 73's

CE6FYN
Juan Carlos Hoyuela

673. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 04:19:53 UTC
From: jend@midway.uchicago.edu
Message-ID: <80397.jend@midway.uchicago.edu>
Source record: 27539

```
subscribe
```

674. ORBS$126.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 13:30:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-126.o.1994@ampr.org>
Source record: 27532
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-126.O
Orbital Elements 126.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX May 6, 1994
BID: $ORBS-126.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94114.79345608
Element set: 275
Inclination: 27.1659 deg
RA of node: 330.6978 deg
Eccentricity: 0.6021287
Arg of perigee: 173.0169 deg
Mean anomaly: 202.1666 deg
Mean motion: 2.05879661 rev/day
Decay rate: -4.8e-07 rev/day^2
Epoch rev: 8168
Checksum: 326

Satellite: UO-11
Catalog number: 14781
Epoch time: 94121.50940340
Element set: 685
Inclination: 97.7888 deg
RA of node: 138.4184 deg
Eccentricity: 0.0013044
Arg of perigee: 60.7255 deg
Mean anomaly: 299.5253 deg
Mean motion: 14.69199714 rev/day
Decay rate: 1.96e-06 rev/day^2
Epoch rev: 54345
Checksum: 330

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94124.10557735
Element set: 894
Inclination: 82.9268 deg
RA of node: 1.4316 deg
Eccentricity: 0.0012217
Arg of perigee: 139.7745 deg
```

Mean anomaly: 220.4499 deg
Mean motion: 13.72337575 rev/day
Decay rate: 1.55e-06 rev/day^2
Epoch rev: 34386
Checksum: 315

Satellite: AO-13
Catalog number: 19216
Epoch time: 94124.38270944
Element set: 907
Inclination: 57.8186 deg
RA of node: 254.4324 deg
Eccentricity: 0.7215430
Arg of perigee: 340.4805 deg
Mean anomaly: 2.0450 deg
Mean motion: 2.09726814 rev/day
Decay rate: -7.11e-06 rev/day^2
Epoch rev: 4509
Checksum: 289

Satellite: FO-20
Catalog number: 20480
Epoch time: 94123.46226144
Element set: 680
Inclination: 99.0307 deg
RA of node: 283.7490 deg
Eccentricity: 0.0541291
Arg of perigee: 80.7567 deg
Mean anomaly: 285.4319 deg
Mean motion: 12.83225461 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 19839
Checksum: 311

Satellite: AO-21
Catalog number: 21087
Epoch time: 94124.13934910
Element set: 460
Inclination: 82.9448 deg
RA of node: 175.3061 deg
Eccentricity: 0.0034211
Arg of perigee: 204.5459 deg
Mean anomaly: 155.4070 deg
Mean motion: 13.74538688 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16353
Checksum: 296

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94125.20169600

Element set: 684
Inclination: 82.9227 deg
RA of node: 43.3261 deg
Eccentricity: 0.0027609
Arg of perigee: 227.9190 deg
Mean anomaly: 131.9616 deg
Mean motion: 13.74039911 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 16274
Checksum: 302

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94124.94294243
Element set: 251
Inclination: 1.7729 deg
RA of node: 101.4452 deg
Eccentricity: 0.2921942
Arg of perigee: 180.0752 deg
Mean anomaly: 180.1868 deg
Mean motion: 1.42202361 rev/day
Decay rate: -1.20e-06 rev/day^2
Epoch rev: 58
Checksum: 258

/EX

675. ORBS$126.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 13:31:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-126.d.1994@ampr.org>
Source record: 27533
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-126.D
Orbital Elements 126.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX May 6, 1994
BID: $ORBS-126.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94124.20914538
Element set: 985
Inclination: 98.5906 deg
RA of node: 209.5802 deg
Eccentricity: 0.0010866
Arg of perigee: 325.4635 deg
Mean anomaly: 34.5845 deg
Mean motion: 14.29840229 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 22330
Checksum: 310

Satellite: AO-16
Catalog number: 20439
Epoch time: 94124.19642159
Element set: 785
Inclination: 98.5995 deg
RA of node: 210.7561 deg
Eccentricity: 0.0011022
Arg of perigee: 326.4829 deg
Mean anomaly: 33.5660 deg
Mean motion: 14.29894404 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 22331
Checksum: 310

Satellite: DO-17
Catalog number: 20440
Epoch time: 94123.24545814
Element set: 784
Inclination: 98.5999 deg
RA of node: 210.1236 deg
Eccentricity: 0.0011292
Arg of perigee: 328.2125 deg
```

Mean anomaly: 31.8370 deg
Mean motion: 14.30033516 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 22319
Checksum: 280

Satellite: WO-18
Catalog number: 20441
Epoch time: 94124.26952701
Element set: 786
Inclination: 98.5998 deg
RA of node: 211.1390 deg
Eccentricity: 0.0011926
Arg of perigee: 325.3145 deg
Mean anomaly: 34.7256 deg
Mean motion: 14.30008193 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 22334
Checksum: 289

Satellite: LO-19
Catalog number: 20442
Epoch time: 94125.23015124
Element set: 784
Inclination: 98.5968 deg
RA of node: 212.3325 deg
Eccentricity: 0.0011929
Arg of perigee: 321.6769 deg
Mean anomaly: 38.3568 deg
Mean motion: 14.30104065 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 22349
Checksum: 296

Satellite: UO-22
Catalog number: 21575
Epoch time: 94124.19704613
Element set: 487
Inclination: 98.4373 deg
RA of node: 199.5777 deg
Eccentricity: 0.0008746
Arg of perigee: 62.7150 deg
Mean anomaly: 297.4930 deg
Mean motion: 14.36911301 rev/day
Decay rate: 6.8e-07 rev/day^2
Epoch rev: 14676
Checksum: 331

Satellite: KO-23
Catalog number: 22077
Epoch time: 94124.15495470

Element set: 382
Inclination: 66.0837 deg
RA of node: 12.1755 deg
Eccentricity: 0.0013264
Arg of perigee: 298.7386 deg
Mean anomaly: 61.2299 deg
Mean motion: 12.86285580 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8112
Checksum: 309

Satellite: AO-27
Catalog number: 22825
Epoch time: 94121.20829173
Element set: 281
Inclination: 98.6565 deg
RA of node: 197.4833 deg
Eccentricity: 0.0009082
Arg of perigee: 352.4372 deg
Mean anomaly: 7.6673 deg
Mean motion: 14.27620742 rev/day
Decay rate: 6.1e-07 rev/day^2
Epoch rev: 3098
Checksum: 309

Satellite: IO-26
Catalog number: 22826
Epoch time: 94125.18734415
Element set: 282
Inclination: 98.6561 deg
RA of node: 201.4545 deg
Eccentricity: 0.0009557
Arg of perigee: 342.2965 deg
Mean anomaly: 17.7898 deg
Mean motion: 14.27724379 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 3155
Checksum: 329

Satellite: KO-25
Catalog number: 22830
Epoch time: 94124.22670221
Element set: 285
Inclination: 98.5577 deg
RA of node: 198.2216 deg
Eccentricity: 0.0011176
Arg of perigee: 310.2112 deg
Mean anomaly: 49.8089 deg
Mean motion: 14.28050061 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 3142

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Checksum: 269

/EX
```

676. ORBS$126.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 13:33:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-126.w.1994@ampr.org>
Source record: 27534
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-126.W
Orbital Elements 126.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX May 6, 1994
BID: $ORBS-126.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94116.57301527
Element set: 798
Inclination: 99.0577 deg
RA of node: 166.4449 deg
Eccentricity: 0.0015509
Arg of perigee: 8.6358 deg
Mean anomaly: 351.5077 deg
Mean motion: 14.13609653 rev/day
Decay rate: 7.9e-07 rev/day^2
Epoch rev: 48305
Checksum: 337

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94120.19649106
Element set: 701
Inclination: 98.5128 deg
RA of node: 130.6674 deg
Eccentricity: 0.0012795
Arg of perigee: 103.3153 deg
Mean anomaly: 256.9287 deg
Mean motion: 14.24880247 rev/day
Decay rate: -1.9e-07 rev/day^2
Epoch rev: 39577
Checksum: 324

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94124.01702454
Element set: 283
Inclination: 82.5393 deg
RA of node: 303.7245 deg
Eccentricity: 0.0016034
Arg of perigee: 309.9437 deg
```

Mean anomaly: 50.0314 deg
Mean motion: 13.84714176 rev/day
Decay rate: 4.0e-08 rev/day^2
Epoch rev: 31624
Checksum: 275

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94123.56735553
Element set: 280
Inclination: 82.5431 deg
RA of node: 355.2630 deg
Eccentricity: 0.0018414
Arg of perigee: 17.7279 deg
Mean anomaly: 342.4475 deg
Mean motion: 13.16966951 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27738
Checksum: 313

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94124.23880605
Element set: 624
Inclination: 99.1695 deg
RA of node: 112.0777 deg
Eccentricity: 0.0010844
Arg of perigee: 258.7118 deg
Mean anomaly: 101.2834 deg
Mean motion: 14.12980952 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 28901
Checksum: 300

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94124.20611987
Element set: 282
Inclination: 82.5208 deg
RA of node: 178.9830 deg
Eccentricity: 0.0014331
Arg of perigee: 357.6373 deg
Mean anomaly: 2.4716 deg
Mean motion: 13.84363931 rev/day
Decay rate: 6.4e-07 rev/day^2
Epoch rev: 26160
Checksum: 305

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94123.13024986

Element set: 35
Inclination: 82.5506 deg
RA of node: 301.1352 deg
Eccentricity: 0.0008080
Arg of perigee: 47.0743 deg
Mean anomaly: 313.1046 deg
Mean motion: 13.04426156 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21702
Checksum: 239

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94123.34265584
Element set: 784
Inclination: 82.5437 deg
RA of node: 244.0769 deg
Eccentricity: 0.0014580
Arg of perigee: 275.8461 deg
Mean anomaly: 84.1027 deg
Mean motion: 13.84188432 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 19441
Checksum: 313

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94125.06255617
Element set: 957
Inclination: 98.8362 deg
RA of node: 146.5700 deg
Eccentricity: 0.0015892
Arg of perigee: 125.8309 deg
Mean anomaly: 234.4338 deg
Mean motion: 14.01325006 rev/day
Decay rate: 2.94e-06 rev/day^2
Epoch rev: 18766
Checksum: 316

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94124.19626608
Element set: 793
Inclination: 82.5272 deg
RA of node: 180.9782 deg
Eccentricity: 0.0013109
Arg of perigee: 164.3711 deg
Mean anomaly: 195.7842 deg
Mean motion: 13.83580182 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 18167

Checksum: 314

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94125.22936710
Element set: 691
Inclination: 82.5450 deg
RA of node: 199.9590 deg
Eccentricity: 0.0012139
Arg of perigee: 298.5027 deg
Mean anomaly: 61.4870 deg
Mean motion: 13.16461976 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14570
Checksum: 302

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94124.37029890
Element set: 29
Inclination: 98.6231 deg
RA of node: 153.1074 deg
Eccentricity: 0.0013424
Arg of perigee: 8.7050 deg
Mean anomaly: 351.4362 deg
Mean motion: 14.22399088 rev/day
Decay rate: 1.29e-06 rev/day^2
Epoch rev: 15430
Checksum: 275

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94124.14072292
Element set: 699
Inclination: 82.5543 deg
RA of node: 147.8549 deg
Eccentricity: 0.0012817
Arg of perigee: 313.9632 deg
Mean anomaly: 46.0416 deg
Mean motion: 13.16830086 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13066
Checksum: 299

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94124.23599147
Element set: 293
Inclination: 82.5467 deg
RA of node: 241.2542 deg
Eccentricity: 0.0022783

```
Arg of perigee: 353.1737 deg
Mean anomaly: 6.9124 deg
Mean motion: 13.83005015 rev/day
Decay rate: 6.1e-07 rev/day^2
Epoch rev: 3401
Checksum: 277

/EX
```

677. ORBS$126.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 13:34:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-126.m.1994@ampr.org>
Source record: 27531
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-126.M
Orbital Elements 126.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX May 6, 1994
BID: $ORBS-126.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94124.23109781
Element set: 275
Inclination: 98.6526 deg
RA of node: 200.5271 deg
Eccentricity: 0.0010115
Arg of perigee: 330.9363 deg
Mean anomaly: 29.1250 deg
Mean motion: 14.28021851 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 3142
Checksum: 260

Satellite: MIR
Catalog number: 16609
Epoch time: 94125.19327133
Element set: 586
Inclination: 51.6474 deg
RA of node: 41.5640 deg
Eccentricity: 0.0014555
Arg of perigee: 219.6070 deg
Mean anomaly: 140.3860 deg
Mean motion: 15.58904639 rev/day
Decay rate: 8.914e-05 rev/day^2
Epoch rev: 46934
Checksum: 311

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94124.36277877
Element set: 475
Inclination: 28.4682 deg
RA of node: 157.4785 deg
Eccentricity: 0.0005921
Arg of perigee: 351.8571 deg
```

Mean anomaly: 8.1918 deg
Mean motion: 14.90591197 rev/day
Decay rate: 5.74e-06 rev/day^2
Epoch rev: 2284
Checksum: 326

Satellite: GRO
Catalog number: 21225
Epoch time: 94121.31897665
Element set: 88
Inclination: 28.4633 deg
RA of node: 197.4670 deg
Eccentricity: 0.0003050
Arg of perigee: 45.9485 deg
Mean anomaly: 314.1339 deg
Mean motion: 15.40718015 rev/day
Decay rate: 2.568e-05 rev/day^2
Epoch rev: 4970
Checksum: 298

Satellite: UARS
Catalog number: 21701
Epoch time: 94125.02595764
Element set: 514
Inclination: 56.9874 deg
RA of node: 332.0307 deg
Eccentricity: 0.0005158
Arg of perigee: 90.9475 deg
Mean anomaly: 269.2149 deg
Mean motion: 14.96482672 rev/day
Decay rate: 3.978e-05 rev/day^2
Epoch rev: 14447
Checksum: 327

/EX

678. ORBS$126.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 13:35:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-126.n.1994@ampr.org>
Source record: 27535
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-126.N
2Line Orbital Elements 126.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX May 6, 1994
BID: $ORBS-126.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94114.79345608 -.00000048 00000-0 10000-3 0 2756
2 14129 27.1659 330.6978 6021287 173.0169 202.1666 2.05879661 81688
UO-11
1 14781U 84021B 94121.50940340 .00000196 00000-0 41030-4 0 6858
2 14781 97.7888 138.4184 0013044 60.7255 299.5253 14.69199714543453
RS-10/11
1 18129U 87054A 94124.10557735 .00000155 00000-0 15346-3 0 8945
2 18129 82.9268 1.4316 0012217 139.7745 220.4499 13.72337575343869
AO-13
1 19216U 88051B 94124.38270944 -.00000711 00000-0 10000-4 0 9072
2 19216 57.8186 254.4324 7215430 340.4805 2.0450 2.09726814 45094
FO-20
1 20480U 90013C 94123.46226144 -.00000027 00000-0 44326-5 0 6806
2 20480 99.0307 283.7490 0541291 80.7567 285.4319 12.83225461198398
AO-21
1 21087U 91006A 94124.13934910 .00000094 00000-0 82657-4 0 4602
2 21087 82.9448 175.3061 0034211 204.5459 155.4070 13.74538688163531
RS-12/13
1 21089U 91007A 94125.20169600 .00000049 00000-0 35936-4 0 6846
2 21089 82.9227 43.3261 0027609 227.9190 131.9616 13.74039911162740
ARSENE
1 22654U 93031B 94124.94294243 -.00000120 00000-0 00000 0 0 2516
2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202361 582
UO-14
1 20437U 90005B 94124.20914538 .00000048 00000-0 35670-4 0 9854
2 20437 98.5906 209.5802 0010866 325.4635 34.5845 14.29840229223300
AO-16
1 20439U 90005D 94124.19642159 .00000047 00000-0 35163-4 0 7855
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2 20439 98.5995 210.7561 0011022 326.4829 33.5660 14.29894404223316
DO-17
1 20440U 90005E 94123.24545814 .00000049 00000-0 35934-4 0 7849
2 20440 98.5999 210.1236 0011292 328.2125 31.8370 14.30033516223199
WO-18
1 20441U 90005F 94124.26952701 .00000035 00000-0 30609-4 0 7861
2 20441 98.5998 211.1390 0011926 325.3145 34.7256 14.30008193223340
LO-19
1 20442U 90005G 94125.23015124 .00000054 00000-0 37901-4 0 7840
2 20442 98.5968 212.3325 0011929 321.6769 38.3568 14.30104065223490
UO-22
1 21575U 91050B 94124.19704613 .00000068 00000-0 37532-4 0 4876
2 21575 98.4373 199.5777 0008746 62.7150 297.4930 14.36911301146764
KO-23
1 22077U 92052B 94124.15495470 -.00000037 00000-0 10000-3 0 3822
2 22077 66.0837 12.1755 0013264 298.7386 61.2299 12.86285580 81126
AO-27
1 22825U 93061C 94121.20829173 .00000061 00000-0 42616-4 0 2811
2 22825 98.6565 197.4833 0009082 352.4372 7.6673 14.27620742 30984
IO-26
1 22826U 93061D 94125.18734415 .00000029 00000-0 29603-4 0 2823
2 22826 98.6561 201.4545 0009557 342.2965 17.7898 14.27724379 31555
KO-25
1 22830U 93061H 94124.22670221 .00000044 00000-0 35042-4 0 2850
2 22830 98.5577 198.2216 0011176 310.2112 49.8089 14.28050061 31428
NOAA-9
1 15427U 84123A 94116.57301527 .00000079 00000-0 66156-4 0 7989
2 15427 99.0577 166.4449 0015509 8.6358 351.5077 14.13609653483058
NOAA-10
1 16969U 86073A 94120.19649106 -.00000019 00000-0 10000-4 0 7014
2 16969 98.5128 130.6674 0012795 103.3153 256.9287 14.24880247395773
MET-2/17
1 18820U 88005A 94124.01702454 .00000004 00000-0 -91349-5 0 2835
2 18820 82.5393 303.7245 0016034 309.9437 50.0314 13.84714176316245
MET-3/2
1 19336U 88064A 94123.56735553 .00000051 00000-0 10000-3 0 2809
2 19336 82.5431 355.2630 0018414 17.7279 342.4475 13.16966951277385
NOAA-11
1 19531U 88089A 94124.23880605 .00000065 00000-0 59988-4 0 6243
2 19531 99.1695 112.0777 0010844 258.7118 101.2834 14.12980952289014
MET-2/18
1 19851U 89018A 94124.20611987 .00000064 00000-0 43646-4 0 2826
2 19851 82.5208 178.9830 0014331 357.6373 2.4716 13.84363931261609
MET-3/3
1 20305U 89086A 94123.13024986 .00000044 00000-0 10000-3 0 356
2 20305 82.5506 301.1352 0008080 47.0743 313.1046 13.04426156217026
MET-2/19
1 20670U 90057A 94123.34265584 .00000023 00000-0 79036-5 0 7849
2 20670 82.5437 244.0769 0014580 275.8461 84.1027 13.84188432194412
FY-1/2
```

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1 20788U 90081A 94125.06255617 .00000294 00000-0 22339-3 0 9577
2 20788 98.8362 146.5700 0015892 125.8309 234.4338 14.01325006187666
MET-2/20
1 20826U 90086A 94124.19626608 .00000062 00000-0 42312-4 0 7935
2 20826 82.5272 180.9782 0013109 164.3711 195.7842 13.83580182181676
MET-3/4
1 21232U 91030A 94125.22936710 .00000050 00000-0 10000-3 0 6912
2 21232 82.5450 199.9590 0012139 298.5027 61.4870 13.16461976145704
NOAA-12
1 21263U 91032A 94124.37029890 .00000129 00000-0 77309-4 0 293
2 21263 98.6231 153.1074 0013424 8.7050 351.4362 14.22399088154303
MET-3/5
1 21655U 91056A 94124.14072292 .00000051 00000-0 10000-3 0 6994
2 21655 82.5543 147.8549 0012817 313.9632 46.0416 13.16830086130665
MET-2/21
1 22782U 93055A 94124.23599147 .00000061 00000-0 42692-4 0 2934
2 22782 82.5467 241.2542 0022783 353.1737 6.9124 13.83005015 34012
POSAT
1 22829U 93061G 94124.23109781 .00000049 00000-0 37665-4 0 2754
2 22829 98.6526 200.5271 0010115 330.9363 29.1250 14.28021851 31424
MIR
1 16609U 86017A 94125.19327133 .00008914 00000-0 11866-3 0 5863
2 16609 51.6474 41.5640 0014555 219.6070 140.3860 15.58904639469344
HUBBLE
1 20580U 90037B 94124.36277877 .00000574 00000-0 42139-4 0 4759
2 20580 28.4682 157.4785 0005921 351.8571 8.1918 14.90591197 22840
GRO
1 21225U 91027B 94121.31897665 .00002568 00000-0 54854-4 0 883
2 21225 28.4633 197.4670 0003050 45.9485 314.1339 15.40718015 49703
UARS
1 21701U 91063B 94125.02595764 .00003978 00000-0 36832-3 0 5144
2 21701 56.9874 332.0307 0005158 90.9475 269.2149 14.96482672144475
/EX
```

679. Mac Satellite Tracking Program

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 14:53:23 UTC
From: mmjjmm@post.its.mcw.edu
Message-ID: <2qdll3$icm@post.its.mcw.edu>
Source record: 27526

What is the best satellite tracking program for use on a Macintosh
computer and where can it be located?
--
Michael J. Malloy Amateur Radio N9WJV
Medical College of Wisconsin Compuserve 70334,3563
Milwaukee, Wisconsin Internet mmjjmm@post.its.mcw.edu

680. Two-Line Orbital Element Sets (TLE389)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-06 23:27:22 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.768266842@afit.af.mil>
Source record: 27527

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #389 -
Alouette 1
1 00424U 62049 94124.53132604 .00000079 00000-0 82598-4 0 9885
2 00424 80.4642 328.0801 0022324 226.8626 133.0653 13.67808413576430
ATS 1
1 02608U 66110A 94121.79596040 -.00000234 00000-0 10000-3 0 8675
2 02608 14.5381 0.8884 0010087 35.2745 19.8337 1.00390904 17005
ATS 3
1 03029U 67111A 94124.80818277 -.00000123 00000-0 10000-3 0 1859
2 03029 14.6121 7.9254 0010037 269.2259 130.9356 1.00272860 97003
Cosmos 398
1 04966U 71016A 94125.47137257 .00087871 64254-5 14058-3 0 1807
2 04966 51.4486 136.8266 1069256 237.7683 111.5029 13.80553583766832
Starlette
1 07646U 75010A 94124.55356756 -.00000130 00000-0 94407-5 0 7754
2 07646 49.8261 325.5373 0206168 192.1208 167.4680 13.82185941971819
LAGEOS
1 08820U 76039A 94125.35601669 .00000026 00000-0 10000-3 0 9880
2 08820 109.8245 120.9300 0044397 294.5156 65.0770 6.38664311164412
ETS-2
1 09852U 77014A 94096.70768241 .00000056 00000-0 10000-3 0 9609
2 09852 12.0278 42.3644 0002272 355.1437 113.0291 0.99996307 9941
GOES 2
1 10061U 77048A 94121.25459711 .00000054 00000-0 10000-3 0 3206
2 10061 11.1129 46.2801 0003623 25.9700 103.7191 1.00289865 6640
IUE
1 10637U 78012A 94125.56126944 -.00000212 00000-0 10000-3 0 9959
2 10637 34.5548 95.5648 1312715 34.5744 245.9931 1.00280828 12298
GPS BI-01
1 10684U 78020A 94118.25301759 -.00000037 00000-0 10000-3 0 2629
2 10684 64.6082 47.0010 0064833 164.7422 195.4949 1.98069017103948
```

```
GPS BI-02
1 10893U 78047A 94124.60864295 -.00000034 00000-0 10000-3 0 631
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2 11054 63.2634 283.0907 0043750 175.7057 184.3059 1.93505201113637
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2 11141 64.6239 47.9290 0048480 24.8795 335.3451 1.92894859 2966
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2 11690 64.9230 48.7127 0142352 191.2377 168.0964 2.00555168118599
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2 11783 62.6820 279.8201 0209933 29.2872 331.8317 2.03456176102992
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2 12472 6.7387 58.5390 0005672 354.8218 66.8899 1.00304812 5336
Cosmos 1383
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2 13301 82.9323 342.8036 0026080 217.7255 142.2069 13.68054627591267
LandSat 4
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IRAS
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LandSat 5
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RS-10/11
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2 19165 65.0034 112.0138 0004157 322.4589 37.5258 2.13102208 46254
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2 19215 1.6432 72.7209 0000517 351.5696 136.6540 1.00282258 9485
AO-13
1 19216U 88051B 94125.33632837 -.00000562 00000-0 10000-4 0 9086
2 19216 57.8271 254.3032 7211377 340.6813 2.0203 2.09724054 13614
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Meteor 3-2
1 19336U 88064A 94125.69457427 .00000051 00000-0 10000-3 0 2817
2 19336 82.5415 353.7563 0018458 12.6013 347.5554 13.16966762277668
Glonass 39
1 19503U 88085C 94125.79890427 -.00000057 00000-0 10000-3 0 1779
2 19503 65.7396 350.7667 0004303 183.7275 176.3302 2.13102090 43864
NOAA 11
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2 19548 0.9199 77.9361 0002052 343.5933 147.1603 1.00282694 7774
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Glonass 41
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2 19750 64.9875 111.4928 0007917 255.7122 104.2014 2.13101716 41398
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2 19802 55.1132 141.4495 0031946 179.8588 180.1898 2.00547611 38176
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MOP-1
1 19876U 89020B 94125.44136900 -.00000082 00000-0 00000+0 0 247
2 19876 0.3683 61.6465 0001098 15.4286 296.4680 1.00273917 6646
TDRS 3
1 19883U 89021B 94123.35867326 -.00000282 00000-0 00000+0 0 9103
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2 20061 54.6792 318.3052 0127834 207.5922 151.7328 2.00565558 35885
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1 20103U 89050A 94125.98598548 .00000014 00000-0 -19934-5 0 9868
2 20103 82.9569 318.8844 0039153 48.0884 312.3584 13.73837382242511
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1 20185U 89064A 94125.03056949 .00000073 00000-0 10000-3 0 9062
2 20185 54.9293 142.0705 0010159 265.8125 94.1109 2.00573676 34506
GMS 4
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2 20217 0.1842 63.7742 0001218 34.2683 4.6178 1.00269441 17658
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COBE
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2 20322 98.9771 142.2712 0009688 33.6878 326.4900 14.03432040228419
Kvant-2
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OKEAN 2
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2 20523 0.0779 73.9793 0000173 343.6101 226.3663 1.00267545 8178
GPS BII-07
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Glonass 45
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2 20724 54.7390 139.7971 0109304 161.2295 199.2182 2.00561815 27442
Feng Yun1-2
1 20788U 90081A 94125.06255617 .00000294 00000-0 22339-3 0 9577
2 20788 98.8362 146.5700 0015892 125.8309 234.4338 14.01325006187666
Meteor 2-20
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DMSP B5D2-5
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Glonass 49
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AO-21
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RS-12/13
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Nadezhda 3
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2 21152 82.9265 1.2961 0042432 346.0882 13.9101 13.73500970157070
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Meteor 3-5
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Glonass 53
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2 21853 64.8974 110.6079 0008933 190.6561 169.3022 2.13102412 17595
Glonass 54
1 21854U 92005B 94125.24638614 .00000072 00000-0 00000+0 0 9551
2 21854 64.8929 110.5378 0016539 8.1038 351.9228 2.13103108 17613
Glonass 55
1 21855U 92005C 94123.43046057 .00000075 00000-0 00000+0 0 9558
2 21855 64.8863 110.6032 0007322 217.3729 142.5724 2.13101048 17560
JERS-1
1 21867U 92007A 94124.21846337 .00001601 00000-0 13810-3 0 3006
2 21867 97.6442 199.8875 0002130 111.3341 248.8110 14.98659296121798
GPS BIIA-12
1 21890U 92009A 94124.89289131 -.00000072 00000-0 10000-3 0 5058
2 21890 54.1508 258.5473 0057279 165.4996 194.6376 2.00572045 16119
GPS BIIA-13
1 21930U 92019A 94123.60678717 -.00000105 00000-0 10000-3 0 4825
2 21930 55.5817 19.6200 0052801 169.1713 190.9455 2.00564256 15010
EUVE
1 21987U 92031A 94122.53800478 .00001306 00000-0 52031-4 0 2915
2 21987 28.4353 0.0652 0010199 195.0077 165.0086 15.18475265105451
SAMPEX
1 22012U 92038A 94124.19773330 .00001041 00000-0 89713-4 0 5110
2 22012 81.6727 217.2652 0119115 182.3037 177.7655 14.90970630 99721
GPS BIIA-14
1 22014U 92039A 94125.13409276 -.00000020 00000-0 10000-3 0 3974
2 22014 54.8985 199.4501 0054736 312.8773 46.7216 2.00564669 6881
Glonass 56
1 22056U 92047A 94122.86186130 -.00000072 00000-0 00000+0 0 8536
2 22056 64.9302 350.4755 0004126 289.4495 70.5483 2.13102933 13649
Glonass 57
1 22057U 92047B 94125.03302637 -.00000063 00000-0 00000+0 0 8609
2 22057 64.9363 350.4159 0007753 330.0419 29.9629 2.13102497 13660
Glonass 58
1 22058U 92047C 94124.97385124 -.00000063 00000-0 00000+0 0 8705
2 22058 64.9354 350.4199 0009008 284.4297 75.5407 2.13103021 13717
TOPEX
1 22076U 92052A 94125.87844526 -.00000038 00000-0 10000-3 0 7534
2 22076 66.0455 18.8819 0007546 264.8186 95.1968 12.80931132 81071
KO-23
1 22077U 92052B 94125.70997510 -.00000037 00000-0 10000-3 0 3837
2 22077 66.0832 8.9194 0013363 298.4544 61.5120 12.86285616 81322
S80/T
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1 22078U 92052C 94125.64950421 -.00000037 00000-0 10000-3 0 3819
2 22078 66.0845 8.3748 0015026 300.7495 59.2040 12.86567420 81383
GPS BIIA-15
1 22108U 92058A 94124.60178892 -.00000069 00000-0 10000-3 0 3958
2 22108 54.3676 259.2429 0110765 137.4092 223.4320 2.00552810 12052
FREJA
1 22161U 92064A 94125.24855857 -.00000057 00000-0 22614-4 0 3950
2 22161 63.0057 41.3208 0782096 311.3722 42.2506 13.21757622 76125
LAGEOS II
1 22195U 92070B 94123.18815927 -.00000009 00000-0 10000-3 0 2859
2 22195 52.6380 122.1161 0138798 97.7768 263.8573 6.47294234 36036
GPS BIIA-16
1 22231U 92079A 94124.29132818 -.00000031 00000-0 10000-3 0 3916
2 22231 54.7253 200.7289 0036654 291.7678 67.8984 2.00558672 10626
GPS BIIA-17
1 22275U 92089A 94124.93308174 -.00000021 00000-0 10000-3 0 3982
2 22275 54.6642 198.2460 0053538 255.8307 103.6598 2.00560264 10043
TDRS 5
1 22314U 93003B 94125.04306134 -.00000289 00000-0 10000-3 0 3920
2 22314 1.0095 72.9858 0002772 323.9919 155.4880 1.00266097 4895
GPS BIIA-18
1 22446U 93007A 94125.00539366 -.00000067 00000-0 10000-3 0 3914
2 22446 54.6891 319.0758 0072626 343.4159 16.3198 2.00574456 9031
Glonass 59
1 22512U 93010A 94122.13939109 .00000068 00000-0 00000+0 0 5627
2 22512 64.9052 110.5014 0009060 209.4253 150.5208 2.13101892 9133
Glonass 60
1 22513U 93010B 94124.89525039 .00000074 00000-0 00000+0 0 5757
2 22513 64.9012 110.4156 0007242 216.9350 143.0149 2.13102368 9384
Glonass 61
1 22514U 93010C 94124.19265778 .00000075 00000-0 00000+0 0 5595
2 22514 64.9106 110.4303 0013412 201.1076 158.8373 2.13101306 9373
ASTRO-D
1 22521U 93011A 94125.04285799 .00000985 00000-0 79777-4 0 2841
2 22521 31.1038 346.9252 0076289 30.7409 329.7676 14.93162649 65642
UFO F1
1 22563U 93015A 94120.62194181 -.00000020 00000-0 10000-3 0 2781
2 22563 26.7316 300.4763 0003510 7.0015 216.4137 0.99247373 8365
GPS BIIA-19
1 22581U 93017A 94123.15011747 -.00000104 00000-0 10000-3 0 2918
2 22581 55.0918 19.3992 0046918 33.2902 327.0844 2.00570140 8058
ARSENE
1 22654U 93031B 94124.94294243 -.00000120 00000-0 00000+0 0 2516
2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202361 582
GPS BIIA-20
1 22657U 93032A 94124.78116615 -.00000106 00000-0 10000-3 0 2977
2 22657 55.1205 19.1435 0062469 206.5400 153.2228 2.00558338 3414
RADCAL
1 22698U 93041A 94125.46200893 .00000072 00000-0 26306-4 0 2899
2 22698 89.5458 311.5997 0091276 328.1619 31.4058 14.21308463 44526
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GPS BIIA-21
1 22700U 93042A 94119.25819824 -.00000029 00000-0 10000-3 0 2856
2 22700 54.5557 260.1956 0025626 321.6954 38.0702 2.00574651 6101
NOAA 13
1 22739U 93050A 94125.87962215 .00000083 00000-0 71362-4 0 4305
2 22739 98.9384 70.4431 0008963 239.8691 120.1591 14.10895550 37994
GPS BIIA-22
1 22779U 93054A 94124.33790092 -.00000067 00000-0 10000-3 0 3140
2 22779 54.8317 319.0179 0022626 224.9062 134.9518 2.00570309 4966
Meteor 2-21
1 22782U 93055A 94124.23599147 .00000061 00000-0 42692-4 0 2934
2 22782 82.5467 241.2542 0022783 353.1737 6.9124 13.83005015 34012
UFO F2
1 22787U 93056A 94119.74573311 -.00000094 00000-0 10000-3 0 2737
2 22787 4.8760 323.3924 0006135 354.2731 240.5443 1.00274427 761
SPOT 3
1 22823U 93061A 94125.73424856 .00000169 00000-0 10000-3 0 2966
2 22823 98.7106 200.8544 0000615 90.7054 269.4182 14.20036518 31466
STELLA
1 22824U 93061B 94122.19675705 -.00000029 00000-0 60716-5 0 2816
2 22824 98.6554 198.3729 0006804 351.3388 8.7679 14.27096443 31118
AO-27
1 22825U 93061C 94126.11433841 .00000021 00000-0 26312-4 0 2821
2 22825 98.6563 202.3414 0008906 338.3637 21.7159 14.27621141 31682
IO-26
1 22826U 93061D 94125.18734415 .00000029 00000-0 29603-4 0 2823
2 22826 98.6561 201.4545 0009557 342.2965 17.7898 14.27724379 31555
HEATHSAT
1 22827U 93061E 94124.19020537 .00000042 00000-0 34778-4 0 3440
2 22827 98.6544 200.4415 0009554 332.4987 27.5688 14.27833268 31413
PO-28
1 22829U 93061G 94124.23109781 .00000049 00000-0 37665-4 0 2754
2 22829 98.6526 200.5271 0010115 330.9363 29.1250 14.28021851 31424
KO-25
1 22830U 93061H 94125.62801112 .00000050 00000-0 37532-4 0 2875
2 22830 98.5576 199.5944 0011126 306.0827 53.9325 14.28050381 31626
GPS BIIA-23
1 22877U 93068A 94125.88736656 -.00000019 00000-0 10000-3 0 1090
2 22877 55.1749 80.1119 0032419 285.6776 73.9568 2.00580276 3886
METEOSAT 6
1 22912U 93073B 94115.00000000 -.00000099 00000-0 00000+0 0 773
2 22912 1.0335 359.9992 0000611 174.6522 28.0102 1.00262257 09
HST Array
1 22920U 90037C 94125.18495440 .00006198 00000-0 52038-3 0 1313
2 22920 28.4706 145.4526 0004402 160.6429 199.4416 14.96414913 23044
Soyuz TM-18
1 22957U 94001A 94124.87273920 .00004421 00000-0 62244-4 0 1093
2 22957 51.6466 43.1764 0014395 219.2424 140.7110 15.58892203 18215
Meteor 3-6
1 22969U 94003A 94123.40567095 .00000067 00000-0 14134-3 0 540
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2 22969 82.5581 87.8533 0016414 21.5944 338.5874 13.16720458 12956
TUBSAT-B
1 22970U 94003B 94124.91759249 .00000101 00000-0 23139-3 0 446
2 22970 82.5466 86.7617 0017012 15.3020 344.8640 13.16820790 13156
1994004C
1 22987U 94004C 94098.46584220 -.00000666 00000-0 00000+0 0 74
2 22987 66.5360 59.3960 9045772 202.2990 31.7820 0.46869300 14
ODERACS A
1 22990U 94006B 94125.48847846 .00057799 00000-0 24657-3 0 626
2 22990 56.9838 163.0012 0022776 73.2841 287.0728 15.84343630 13392
ODERACS B
1 22991U 94006C 94124.50151954 .00069472 00000-0 30326-3 0 617
2 22991 56.9841 167.7539 0022170 72.7749 287.5703 15.83814486 13233
ODERACS E
1 22994U 94006F 94125.21159322 .00026815 00000-0 15054-3 0 587
2 22994 56.9817 166.0342 0021533 78.4227 281.9154 15.78848607 13323
ODERACS F
1 22995U 94006G 94126.22639703 .00028786 00000-0 16050-3 0 683
2 22995 56.9845 161.4369 0021740 78.2204 282.1302 15.78952465 13489
BREMSAT
1 22998U 94006H 94124.25709561 .00033230 00000-0 19428-3 0 498
2 22998 56.9846 171.0048 0017636 86.4595 273.8460 15.77935168 13018
GPS BIIA-24
1 23027U 94016A 94123.96719402 -.00000105 00000-0 00000+0 0 370
2 23027 54.9396 21.2815 0062473 190.1088 169.7936 2.00556282 1158
SEDS 2
1 23028U 94016B 94126.27262411 .02095157 54085-2 11648-2 0 774
2 23028 32.3423 310.5640 0006322 330.1788 29.8729 16.19553709 9064
ProgressM22
1 23035U 94019A 94124.87273920 .00004421 00000-0 62244-4 0 516
2 23035 51.6466 43.1764 0014395 219.2424 140.7110 15.58892203 6838
Cosmos 2275
1 23043U 94021A 94125.73607725 -.00000060 00000-0 00000+0 0 386
2 23043 64.8181 350.8056 0005174 170.2327 189.8288 2.13082027 524
Cosmos 2276
1 23044U 94021B 94120.92669355 -.00000072 00000-0 00000+0 0 215
2 23044 64.8002 351.0143 0027585 201.6118 158.4568 2.13093421 426
Cosmos 2277
1 23045U 94021C 94125.73607347 -.00000060 00000-0 00000+0 0 254
2 23045 64.8161 350.8549 0006635 195.6616 165.0095 2.13120342 521
1994021F
1 23048U 94021F 94121.96269222 -.00000074 00000-0 00000+0 0 169
2 23048 64.8020 350.9809 0006650 250.1688 109.7976 2.13314878 365
1994021G
1 23049U 94021G 94122.64799779 -.00000020 00000-0 13957-4 0 162
2 23049 64.8053 343.8040 5801965 296.4947 16.1652 4.23184061 812
1994021H
1 23050U 94021H 94123.59224457 .00000191 00000-0 18952-3 0 195
2 23050 64.8764 343.3477 5802252 296.4649 16.1827 4.23203919 853
GOES 8
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1 23051U 94022A 94126.00000000 -.00000127 00000-0 00000+0 0 889
2 23051 0.4645 0.0010 0064553 313.8007 178.9855 0.99841747 00
1994022B
1 23052U 94022 B 94118.14973816 .00061673 00000-0 28736-2 0 184
2 23052 026.9371 107.9184 7603625 186.3186 149.9875 01.92086422000281
Cosmos 2278
1 23087U 94023A 94124.23813188 .00000181 00000-0 12452-3 0 91
2 23087 71.0034 355.5074 0004125 49.8264 310.3219 14.12134821 1547
1994023B
1 23088U 94023B 94125.07446048 -.00000099 00000-0 -27159-4 0 150
2 23088 71.0053 353.6752 0004919 292.9687 67.0913 14.13778801 1676
1994023C
1 23089U 94023C 94123.61183104 -.00000091 00000-0 -48253-4 0 105
2 23089 71.0290 358.4986 0200770 82.5671 279.8271 13.71647581 1438
1994023D
1 23090U 94023D 94124.11092245 .00000146 00000-0 17718-3 0 63
2 23090 71.0351 357.5668 0193171 57.4738 304.4910 13.73115815 1512
1994023E
1 23091U 94023E 94125.07456323 -.00000023 00000-0 17683-4 0 57
2 23091 70.9854 355.1012 0201860 79.9985 282.3864 13.71150319 1635
Cosmos 2279
1 23092U 94024A 94124.37511774 .00000024 00000-0 10000-4 0 93
2 23092 82.9436 269.3939 0033900 265.2608 94.2889 13.74972711 1143
1994024B
1 23093U 94024B 94126.25643806 -.00000331 00000-0 -35383-3 0 155
2 23093 82.9377 267.9845 0026555 252.6497 107.1695 13.76391641469328
1994023F
1 23094U 94023F 94124.04982348 -.00001122 00000-0 -10329-2 0 79
2 23094 70.9900 357.1503 0203888 54.1361 307.8488 13.71596999 1499
1994025A
1 23095U 94025A 94126.20423187 .00107149 85385-5 16855-3 0 230
2 23095 70.3776 136.4841 0044103 95.6996 264.9250 16.01865051 1208
1994025B
1 23096U 94025B 94122.52458333 .17850818 42186-5 22621-3 0 217
2 23096 70.3468 146.8142 0012434 102.3051 259.9425 16.48817155 622
1994027A
1 23099U 94027A 94125.06345500 -.00000164 00000-0 10000-4 0 87
2 23099 46.0364 131.3585 0345134 179.2345 180.8130 14.64947861 196
1994027B
1 23100U 94027B 94125.06366272 -.00000012 00000-0 21525-4 0 41
2 23100 46.0351 131.3583 0345674 179.1401 181.0127 14.64685172 197
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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681. Re APT Wheather

Newsgroup: rec.radio.amateur.space
Date: 1994-05-07 00:53:31 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <CpEqH7.EuC@freenet.carleton.ca>
Source record: 27528

What would be the 'best case' resolution of NOAA's either or VIS / IR
or both.Another way of asking is what number of pixels do their sensors
use?Also while we are at it, what is 'best case' gray scale resolution?
Let mme e know if you can.Or perhaps direct me to a reliable source for
this info.
Thank you, reader!

682. Re: Russian space station MIR

Newsgroup: rec.radio.amateur.space
Date: 1994-05-07 04:48:07 UTC
From: alwalsh@nickel.ucs.indiana.edu
Message-ID: <CpF1C7.Jq@usenet.ucs.indiana.edu>
Source record: 27529

In article <2q6ar5$4f9@amhux3.amherst.edu>,
Jared Barney Hertzberg <jbhertzb@unix.amherst.edu> wrote:
>Can anyone tell me what MIR's uplink and downlink frequencies are, how often
>they are likely to transmit, and whether there are any hams aboard at this
>time?
>
>Thanks.
> -Jared Hertzberg N2YES
> jbhertzb@amhux3.amherst.edu
>

The uplink and downlink are the same - 145.55. There's no set schedule as far as I know, they just transmit whenever their work schedule permits. I'm pretty sure that the 1200b packet station is almost always up. And for as long as I can remember (last couple of years), every cosmonaut aboard MIR is a ham. Watch this newsgroup and your local PBBS for info on who's on board and what call sign they are currently using.

Happy hunting and 73!

-Alan

683. Re: MIR station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-07 04:49:23 UTC
From: alwalsh@nickel.ucs.indiana.edu
Message-ID: <CpF1EB.Mr@usenet.ucs.indiana.edu>
Source record: 27530

In article <85@ce6fyn.radio.cl>,
Juan Carlos y Cesar Hoyuela <ce6fyn@enlaces.ufro.cl> wrote:
>Hi I'm interesting in contac with, MIR
>anyone now what is the operating frecuency by packet or fone in
>VHF.
>
>please send msg: ce6fyn@ce6fyn.radio.cl

You can work MIR on 145.55mhz.

Good luck and 73.

-Alan

684. Re: Mac Satellite Tracking Program

Newsgroup: rec.radio.amateur.space
Date: 1994-05-07 14:47:28 UTC
From: aandh@eskimo.com
Message-ID: <CpFt39.4H3@eskimo.com>
Source record: 27537

Hi, JOHN check this mo qst had info from Amsat on traking program for
Mac
73 Jim UA4PDG/K7UDG

685. Re: Mac Satellite Tracking Program

Newsgroup: rec.radio.amateur.space
Date: 1994-05-07 18:35:02 UTC
From: tstader@aol.com
Message-ID: <2qgn0m$hir@search01.news.aol.com>
Source record: 27536

In article <2qdll3$icm@post.its.mcw.edu>, mmjjmm@post.its.mcw.edu (Michael Malloy) writes:

*** Satellite tracking ***
<SatTrack v1.02>
Tracks one satellite across a world map as it moves, displays the instantaneous position of several satellites, or generates tables of all satellites visible from a certain location at a given time. Also calculates beam headings, Maidenhead grid locations, and MUFs. Shareware. Available via anonymous FTP from sumex-aim.stanford.edu (/info-mac/app). Or send a formatted 800K Macintosh disk with stamped, self-addressed disk mailer to Mike Pflueger, WD8KPZ, 6207 W. Beverly Lane, Glendale, AZ 85306.

<MacSat v3.1>
Tracks up to 21 satellites simultaneously, either in simulation or real-time mode. Text screen displays ground-track coordinates, range, mean anomaly, visibility (azimuth and elevation) and Doppler shift frequency information for all satellites being tracked. Graphical screen portrays the satellite ground tracks superimposed on a world map. Polar plot displays graphically the precise location of each visible satellite above the observer's horizon. Developed by the Geodetic Research Laboratory of the University of New Brunswick. Available from Richard B. Langley, R.R. 12, Fredericton, N.B. E3B 6H7, Canada (Internet: lang@unb.ca). A demo version of MacSat may be ftp'ed from directory PUB.CANSPACE on unbmvs1.csd.unb.ca.
System 7

<OrbiTrack> <OrbiTrackFPU v2.1.4>
Calculates look angles to selected satellites, plots current satellite positions on a world map, and displays the visible passage of a satellite against background stars (either within the program itself or via a data file that can be read into the Voyager astronomy program). Please note that one version requires an FPU to operate! BEK Developers, P.O. Box 47114, St. Petersburg, FL 33743. (Bill Bard, CompuServe: 75366,2557) (Note: This replaces BEK's previous MacSat program, which was not related to the program of the same name from UNB.)

<QuikMac>
Macintosh version of N4HY's QuikTrak program. Requires Microsoft BASIC. AMSAT, P.O. Box 27, Washington, DC 20044.

<Satellite Orbit Prediction Program>
Macintosh conversion of W3IWI program. Requires Microsoft BASIC. Send formatted 800K Macintosh disk with stamped, self-addressed disk mailer to Earl Skelton, N3ES, 6311 29th Place NW, Washington, DC 20015. Or send self-addressed stamped envelope for source listing.

<Satellite Pro>
Uses world maps and tables to indicate rising and setting schedules, current locations, mutual visibility opportunities, and footprints. Includes Mercator, polar, and great-circle displays. Optional antenna control. MacTrak Software, P.O. Box 1590, Port Orchard, WA 98366.

<MacSPOC>
Author is on AOL and can be reached as adamod@aol.com via the internet.

Misc. Internet FTP sites for
Amateur Radio Macintosh software

joker.optics.rochester.edu (/ham)
sumex-aim.stanford.edu (/info-mac/app)
mac.archive.umich.edu various locations
uxc.cso.uiuc.edu (/pub/ham-radio)
ucsd.edu (/hamradio) many different subdirectories
(/hamradio/packet/tcp/incoming) newest
files temp holding area
(/hamradio/packet/tcpip/pa2aga)
NET/Mac & IM/Mac area
ftp.apple.com (/pub/ham-radio)
akutaktak.andrew.cmu.edu (/aw0g)
softkiss-mac nic.switch.ch (/software/mac/ham-radio)
world.std.com (/pub/hamradio/mac)

This should help.

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Internet: tstader@aol.com (files <28K) or
p00489@psilink.com (files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM
ka8scp@ka8scp.ampr.org [44.56.4.82] Mac
ka8scp-1@ka8scp-1.ampr.org [44.56.4.120] DOS Clone
(they're BOTH pc's!)

686. ANS-127 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 03:17:44 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-127.01.1994@ampr.org>
Source record: 27540
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-127.01
AMSAT-NA BEST EVER DAYTON

HR AMSAT NEWS SERVICE BULLETIN 127.01 FROM AMSAT HQ
SILVER SPRING, MD MAY 7, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-127.01

Dayton Hamvention '94 Termed "Best Ever" For AMSAT-NA

The 1994 Dayton Hamvention is now history, and AMSAT-North America's (AMSAT-NA) participation at this year's gathering was nothing short of a record breaker from a number of standpoints. "While all the numbers aren't in yet, we now believe this will be our best year ever for AMSAT at Dayton," said Bill Tynan (W3XO) AMSAT-NA President. He went on to express his sincere thanks for the very long hours, lost sleep and hard work put forth by the many Dayton AMSAT booth volunteers, forum speakers and contributors. In addition, Bill expressed his particular pleasure that the success at this year's Hamvention also coincided with AMSAT's 25th anniversary celebration. Without question, the highlight of this year's Hamvention activity was a forum honoring the 10th anniversary of SAREX activity aboard the NASA Space Shuttle. Roy Neal (K6DUE) moderated the forum and was joined on the podium by NASA Shuttle Astronauts Tony England (W0ORE) and Steve Nagel (N5RAW) along with several other members of the SAREX working group. Also joining the group by live telephone patch were Astronauts Jay Apt (N5QWL) at the Johnson Space Flight Center in Houston and Astronaut Ron Parise (WA4SIR) at the Goddard Space Flight Center in Greenbelt, Maryland. In addition, a surprisingly clear telephone patch was successfully completed to Astronaut Ken Cameron (KB5AWP) in Star City, Russia. Ken is now training there for an upcoming joint NASA/Soyuz mission to the Russian Space Station MIR. All the astronauts shared their on-orbit experiences with ham radio and answered several questions from the gathering of Hamvention attendees. A number of students who have contacted the Shuttle via Amateur Radio in the past were also present at the forum and gave their own first hand impressions of their activities. Local TV coverage from all three Dayton commercial television stations highlighted the NASA astronauts speaking to the standing-room-only crowd of nearly 500 present at the event.

Other AMSAT activities at this year's Hamvention included a beginner's forum hosted by Keith Baker (KB1SF) along with a new PACSAT forum hosted by John Hansen (WA0PTV). Ed Krome (KA9LNV) highlighted the simplicity of Mode-S in a forum dedicated exclusively to that activity. Dick Jansson (WD4FAB) AMSAT-NA's VP for Engineering, was also on the program and brought

Hamvention attendees up to speed on the latest developments with Phase 3-D. In addition, Ron Broadbent (G3AAJ) the Honorable Secretary of AMSAT-UK, gave his organization's perspective on the Phase 3-D project. Ron also announced to the group that a $100,000 contribution from AMSAT-UK was recently made to the Phase 3-D project specifically for the purchase of flight batteries for the new spacecraft.

Unfortunately, two days of steady rain on Friday and Saturday followed by extremely cold weather on Sunday kept most of the crowd indoors. Despite the bad weather, however, well over 200 people stopped by the booth to initially join or renew their memberships in AMSAT-NA.

New items at this year's AMSAT booth included two new software programs and a number of other items. Joe Holman (KA7LDN) unveiled AMSAT-NA's first ever Microsoft Windows-based satellite tracking program called WINSAT. In addition, a new Microsoft Windows-based PB/PG packet software package called WISP written by Chris Jackson (ZL2TPO), was premiered at the booth. Needless to say, both of these new AMSAT software packages were in great demand by Hamvention attendees.

Other new items included an AMSAT 25th Anniversary patch and decal. Also, several new books were premiered at the booth, including the fourth and latest edition of "How to Use the Amatuer Radio Satellites" by Keith Baker (KB1SF) and a newly revised "AMSAT-NA Digital Satellite Guide" edited by Gould Smith (WA4SXM).

[The AMSAT News Service (ANS) would like to thank KB1SF, W3XO, and KA3HDO for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-127.02
UoSAT STUDENT/HAM HONORED

HR AMSAT NEWS SERVICE BULLETIN 127.02 FROM AMSAT HQ
SILVER SPRING, MD MAY 7, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-127.02

G7MBF Recognized For His Research With POSAT-OSCAR-28's GPS Experiment

Congratulations are in order for University of Surrey (UoSAT) student Martin Unwin (G7MBF) who won the "Best Student Paper Prize" for his paper titled "Differential GPS Implementation on Microsatellites" presented at the recent Differential Satellite Navigation Systems Conference held in London. The award was sponsored by INMARSAT and the Royal Institute of Navigation and consists of $1,000 to be used for continuing research in GPS at UoSAT; it was presented to Martin by Olaf Lundburg, the Director General of INMARSAT.

The PoSAT-OSCAR-28 GPS experiment has been highly successful automatically generating keplerian elements on-board based on GPS location measurements. Efforts are under way to use ground-based radars or other "cross-checks" to see just how accurately the GPS receiver is measuring the satellite's

position in orbit.

[The AMSAT News Service (ANS) would like to thank Jeff Ward (K8KA/G0SUL) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-127.03
AO-13 OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 127.03 FROM AMSAT HQ
SILVER SPRING, MD MAY 7, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-127.03

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS
14-May-94 1700 B 167 WA5ZIB W5IU
21-May-94 2130 B 185 VE2LVC W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

"Slow Scanners" are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other SSTV skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-127.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 127.04 FROM AMSAT HQ
SILVER SPRING, MD MAY 7, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-127.04

Weekly OSCAR Status Reports: 07-MAY-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Apr 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only

Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Blon/Blat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The FO-20 ground command station has confirmed that the bird has been malfunctioning. The operational schedule announced previously is currently suspended and the analog mode will be continued indefinitely. Further operation schedule will be announced on and after 11-May-94. [Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

KO-25: KO-25 B has apparently been moved to the alternate receive frequency because of trouble with the other receiver. So uplink now is 145.870 MHz. The controllers note that the receiver may be turned off intermittently due to receiver testing. [WH6I]

AO-16: Working well. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Operating Normally. [WH6I]

UO-11: WB1HBU talked with Doug Loughmiller (G0SYX) of the University of Surrey (UoSAT) while they both were at the Dayton Hamvention and G0SYX indicated that UO-11's S band beacon is now on continuously. The frequency is 2401.5 MHz. [WB1HBU & G0SYX]

RS-10/11: WA6ARA reports that RS-10 is operating beautifully! The passes at his QTH are coming around again in the late evening. WA6ARA is presently using QRP power, about 5W, using CW into a J pole with excellent results. WA6ARA says that "this bird continues to put out an excellent signal." [WA6ARA]

RS-12/13: HA5WH friend, Sanyi (XU7VK), is working from Cambodia during the daytime on RS-12. His biggest problem is finding stations to make QSOs with. HA5WH requests all stations in that area who use RS-12 to listen for XU7VK on RS-12. [HA5WH]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

687. FCC REGS?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 04:07:00 UTC
From: ronald.hobbs@toadhall.com
Message-ID: <73.897.3344.0N690CF9@toadhall.com>
Source record: 27557

CROSSPOST ALERT

I have seen Ramsey Electronic's Ads for transmitters for "Dorm"
stations,etc.

I would like to put a station on the air that doesn't violate any FCC
Regs or entail great licensening expense (or power). Does anybody know
anything? I am a ham radio operator, don't want to jeopardize my ticket
or run a pirate station. I have the "book" here but who knows chapter
and verse?--the FCC lines are always busy.

Thanks for your space and time. 73 de Ronald.

 SLMR 2.1a Backup not found: (A)bort (R)etry (P)anic

688. Is there a Pacsat/Internet Gateway??

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 06:50:29 UTC
From: Jim Corenman <dentarthur@delphi.com>
Message-ID: <5k7s8RI.dentarthur@delphi.com>
Source record: 27541

This is probably a dumb question, but I've been unable to find the answer amongst the packet or satellite faq files, or anywhere esle I've looked. Frequencies and modes I found, but is it possible, on a routine basis, to pass messages between the packet birds and internet e-mail?

It sounds like it ought to work, in theory, but I have not seen any reference to a gateway between a pacsat and anything else, like either the 2-meter packet or internet directly.

The goal is to be able to pass traffic to and from our sailboat from offshore in the South Pacific. Going between internet and the terrestrial packet network is no problem, but then what?

If it can be done, which birds, and how should the traffic addressed? Any information or places to look would be greatly appreciated. We're returning to Auckland in a few days to rejoin our boat and head back to Tonga.

Jim Corenman, KE6RK / Sue Corenman KB6FRF

689. What are MET-3/4, MET-3/5 and MET-2/21?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 08:54:21 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <2qktnt$9js@usenet.INS.CWRU.Edu>
Source record: 27542

I notice that the March/April issue of the "AMSAT Journal"
has orbital elements for three satellites named MET-3/4, MET-3/5
and MET-2/21, NORAD Ids 21232, 21655 and 22782 respectively.
What are these satellites? Do they have any accessable
amateur gear on board? If so, what are the frequencies and
modulation?

Thanks,
Dave, N9LTD

690. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 08:55:25 UTC
From: lennart@middle.sdn.telia.SE
Message-ID: <9405090855.AA12190@chimay.middle.sdn.telia.se>
Source record: 27543

SUBSCRIBE

691. Re: Re APT Wheather

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 09:25:59 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CpJ3JC.2x1@bbc.co.uk>
Source record: 27544

Herb Dieben (ag381@FreeNet.Carleton.CA) wrote:

: What would be the 'best case' resolution of NOAA's either or VIS / IR
: or both.Another way of asking is what number of pixels do their sensors
: use?Also while we are at it, what is 'best case' gray scale resolution?
: Let mme e know if you can.Or perhaps direct me to a reliable source for
: this info.
: Thank you, reader!

Best case hoorizontal resolution is 4800 pixels per line. The grey scale
resolution depends on your convertor.

john b
john.boyer@rd.eng.bbc.co.uk

692. TEST

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 12:04:34 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-090594120629@129.26.163.253>
Source record: 27545

Test, please ignore


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

693. APT-Satellites: Report MAY 07, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 12:07:36 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-090594120825@129.26.163.253>
Source record: 27548
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, MAY 07, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.40 ON again (weak)
Meteor 3-5: APT 137.85 On

Meteor 2-21 is back again, but weak as always (antenna-
problem). Meteor 3-5 is at the terminator, illumination-
conditions become bad. No IR-ransmissions during evening
ascending passes.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

694. Re: What are MET-3/4, MET-3/5 and MET-2/21?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 12:19:24 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-090594121048@129.26.163.253>
Source record: 27546

In article <2qktnt$9js@usenet.INS.CWRU.Edu>, dt650@cleveland.Freenet.Edu (David J. Mullenix) wrote:

>
> I notice that the March/April issue of the "AMSAT Journal"
> has orbital elements for three satellites named MET-3/4, MET-3/5
> and MET-2/21, NORAD Ids 21232, 21655 and 22782 respectively.
> What are these satellites? Do they have any accessable
> amateur gear on board? If so, what are the frequencies and
> modulation?
>
> Thanks,
> Dave, N9LTD

Meteor 3-4 and Meteor 3-5 are Weather-Satellites lauched by the former USSR. Meteor 2-21 is one of the older Meteor-2 - Class-Weather-Satellites, lauched end of 1993 by Russia. Met 3-5 and Met 2-21 transmit real-time-images using APT (Automatc Picture Transmission) on 137.85 MHz (3-5) and 137.40 MHz (2-21). They use FM-Modulation (15 kHz deviation) to transmit an AM-Subcarrier of 2400 Hz modulated by the image, 2 lines per second, max 1600 Hz image-data. No "classical" amateur-gear (transponder/repeater etc).

Hope that helps a little
Peter

+--+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+--+

695. Re:Re: Re APT Wheather

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 12:37:18 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-090594122346@129.26.163.253>
Source record: 27547

In article <CpJ3JC.2x1@bbc.co.uk>, boyer@rd.eng.bbc.co.uk (John Boyer)
wrote:

> Herb Dieben (ag381@FreeNet.Carleton.CA) wrote:
>
>
> : What would be the 'best case' resolution of NOAA's either or VIS / IR
> : or both.Another way of asking is what number of pixels do their sensors
> : use?Also while we are at it, what is 'best case' gray scale resolution?
> : Let mme e know if you can.Or perhaps direct me to a reliable source for
> : this info.
> : Thank you, reader!
>
>
> Best case hoorizontal resolution is 4800 pixels per line. The grey scale
> resolution depends on your convertor.
>
>
> john b
> john.boyer@rd.eng.bbc.co.uk

Oh, I am in doubt....if you talk about APT.
Subcarrier is 2400 Hz, AM-modulated max 1600 Hz, 2 Lines/sec
containing a vis-Line and a Th.IR-line. So we can rely on just
not very much more than 400 dots per line. This gives a pixel-
resolution of 7.2 km x 3.6 km (scan-dir x orbit-direction).
Resolution of greyscale is not better than 1:200 (if you reach that,
normally your converter will achieve 1:64 or so): APT is an
analog format.
HRPT-Resolution is 2048 Pix/lin, 10 Bit depth per channel, a frame
has 5 channels, 6 frames per second. Resolution is just below 1x1 km.
10 Bit depth: HRPT is a digital format, you will see the full
resolution or nothing.

Regards
Peter

+--+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+--+

696. ARLK018 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 14:26:13 UTC
From: mtracy@arrl.org
Message-ID: <$arlk018.1994@ampr.org>
Source record: 27553
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK018
ARLK018 Keplerian data

ZCZC SK85
QST de W1AW
Keplerian Bulletin 18 ARLK018
>From ARRL Headquarters
Newington, CT May 7, 1994
To all radio amateurs

SB KEP ARL ARLK018
ARLK018 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94189.76632148 0.00073311 21920-3 0 22
2 99965 28.4664 14.3253 0003598 331.2635 28.7780 15.90320458 27
AO-10
1 14129U 83058B 94114.79345608 -.00000048 10000-3 0 2755
2 14129 27.1659 330.6978 6021287 173.0169 202.1666 2.05879661 53711
RS-10/11
1 18129U 87054A 94121.18919744 0.00000042 29696-4 0 8939
2 18129 82.9269 3.5863 0011828 147.4321 212.7566 13.72335967343461
UO-11
1 14781U 84021B 94121.50940340 0.00000196 41030-4 0 6857
2 14781 97.7888 138.4184 0013044 60.7255 299.5253 14.69199714543453
RS-12/13
1 21089U 91007A 94120.83254332 0.00000029 14664-4 0 6838
2 21089 82.9223 46.5654 0027592 240.6427 119.1965 13.74039477162149
AO-13
1 19216U 88051B 94122.47545311 -.00000513 10000-4 0 9061
2 19216 57.8200 254.7637 7215251 340.3465 2.0487 2.09725862 13551
UO-14
1 20437U 90005B 94120.22041354 0.00000038 31834-4 0 9844
2 20437 98.5906 205.6452 0011073 337.4440 22.6261 14.29839428222731
AO-16
1 20439U 90005D 94119.71801448 0.00000074 45929-4 0 7844
2 20439 98.5993 206.3327 0010968 339.7589 20.3143 14.29893858222673
```

```
DO-17
1 20440U 90005E 94119.18729755 0.00000041 32802-4 0 7836
2 20440 98.6000 206.1146 0011402 340.4502 19.6244 14.30032749222613
WO-18
1 20441U 90005F 94120.21129483 0.00000018 24097-4 0 7858
2 20441 98.5999 207.1304 0012084 337.2746 22.7898 14.30007423222765
LO-19
1 20442U 90005G 94120.26264694 0.00000035 30468-4 0 7834
2 20442 98.6010 207.4275 0012382 336.8800 23.1823 14.30102924222785
FO-20
1 20480U 90013C 94120.42157550 0.00000001 65222-4 0 6798
2 20480 99.0307 281.2858 0541404 87.6729 278.6220 12.83225711198002
AO-21
1 21087U 91006A 94123.19304016 0.00000094 82657-4 0 4592
2 21087 82.9456 176.0070 0034195 207.1604 152.7746 13.74538605163405
UO-22
1 21575U 91050B 94122.73473470 0.00000070 38160-4 0 4867
2 21575 98.4372 198.1440 0008749 66.8648 293.3457 14.36911021146550
KO-23
1 22077U 92052B 94123.14419158 -.00000037 10000-3 0 3817
2 22077 66.0834 14.2909 0013271 299.2245 60.7446 12.86285505 80994
KO-25
1 22830U 93061H 94119.74251263 0.00000039 33232-4 0 2843
2 22830 98.5578 193.8277 0011299 323.5993 36.4420 14.28049271 30787
IO-26
1 22826U 93061D 94120.70214003 0.00000021 26462-4 0 2812
2 22826 98.6560 197.0112 0009659 355.1952 4.9126 14.27723732 30919
AO-27
1 22825U 93061C 94121.20829173 0.00000061 42616-4 0 2810
2 22825 98.6565 197.4833 0009082 352.4372 7.6673 14.27620742 30984
PO-28
1 22829U 93061G 94120.16722791 0.00000043 35038-4 0 2748
2 22829 98.6528 196.5018 0010253 342.8173 17.2668 14.28021059 30849
Arsene
1 22654U 93031B 94117.21043337 -.00000111 00000-0 0 2503
2 22654 1.7570 101.6753 2923548 179.5215 181.7522 1.42202344 476
Mir
1 16609U 86017A 94122.88546643 0.00005521 76183-4 0 5847
2 16609 51.6461 53.1484 0014669 210.6080 149.4058 15.58851134468982

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
May 10, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

697. * SpaceNews 09-May-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 16:48:15 UTC
From: John Magliacane <kd2bd@ka2qhd.de.com>
Message-ID: <$spc0509.1994@ampr.org>
Source record: 27556
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0509
* SpaceNews 09-May-94 *

BID: $SPC0509

=========
SpaceNews
=========

MONDAY MAY 9, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* SPACE CALENDAR *
==================
May 10 - Annular Solar Eclipse, Visible from Mexico, USA, Canada
May 20 - Resurs Launch (Russian)
May 24-25 - Partial Lunar Eclipse
May 25 - DSPSE (Clementine), 4th Earth Flyby
May 27 - DSPSE (Clementine), Lunar Flyby

[Info via LU7AKC]

* WEBERSAT NEWS *
=================
WEBERSAT (WO-18) is broadcasting new pictures and light spectrometer data weekly. Software for the extraction, decoding, and display of spectrometer data, written by Bob (KB7KCL), is available on LO-19 (file #s 371a/3739), or directly from Weber State University. Monday UTC continues to be the day for the broadcast of the most recent spectrum, along with the week's WOD.

WeberWare 1.0, 1.2, 1.3, or a similar program is required for picture extraction, decoding, and display. WeberWare 1.3 is the current software version, and is available from Weber State University, AMSAT-NA, or AMSAT-UK. The most recent WeberSat double field image is number 10/14, which was taken of an as yet unidentified area of Northern Nigeria, Africa. The photo has very few clouds, and land features are clearly visible. Expect new photos sometime during the week of May 9th.

WO-18 is currently sending spacecraft solar array current whole orbit data (WOD). This is an excellent opportunity for a student, group, or class to use this data for spacecraft motion studies, or for studying the long term effects of the space environment on solar cell effeciency. WOD collection and broadcast will adhere to the following schedule:

1 May/Week1: Array currents, Ch# 26 27 28 29 2A 2B
8 May/Week2: Array currents, Ch# 26 27 28 29 2A 2B during 10-May-94 eclipse
15 May/Week3: BCR, 21 22 29 2F 33 36
22 May/Week4: Temperatures and impact detector, Ch# 14 2F 30 35 3B 40
29 May/Week1: Array currents, Ch# 26 27 28 29 2A 2B

[Info via EA2CLS]

* MICROSAT DESIGN AT STANFORD *
==========

Over the years a number of Stanford researchers have been involved in the design and operation of dozens of different kinds of space vehicles. But, beginning this year, the Aeronautics and Astronautics Department has initiated a new program that involves students in designing, constructing and controlling small, simple and inexpensive "microsatellites" that are launched into orbit.

On Thursday, April 21, two dozen engineering students involved in this program at Stanford University showed a mock-up of their first satellite design to a visiting Russian official, Yuri Plotnikov, professor of flight mechanics and control design at the Moscow Aviation Institute.

If the project goes as planned, a year from now the 2-foot-wide hexagonal satellite will hitch a ride on top of a Delta rocket along with a commercial satellite. Once it goes into orbit, the satellite will begin beaming back digital pictures of Earth and broadcasting its position and status over ham radio channels with a synthesized voice.

"The program has two major objectives," said Robert Twiggs, a visiting professor brought to Stanford from Weber State University in Utah to jump-start the new small satellite development laboratory. "First is to give graduate students in aero-astro and other departments practical, hands-on experience in designing and building something that can be launched into space in only a year on a very limited budget. Second is to provide faculty, students, space experimenters and industry with an opportunity to do inexpensive space experiments."

Plotnikov's interest stems from the fact that the Moscow Aviation Institute is a professional school with 15,000 students devoted to aerospace design. "The name is historical. Actually, we design anything that flies," he said. The institute currently has a joint satellite program with Utah State University. When asked whether something similar is likely with Stanford, he shrugs and replies, "It's all a matter of funding."

The students have nicknamed their design the Stanford (or Satellite) Quick Research Testbed, or SQUIRT. They hope that this could become a de facto standard for microsatellites, which are a growing phenomenon worldwide. Students at the University of Umea in Kirna, Sweden, are working on a parallel design. So far, about a dozen student-designed microsatellites have been built and launched.

The watchwords for these satellites are simple and inexpensive. So the Stanford design uses powerful magnets to keep the satellite aligned perpendicular to the Earth's magnetic field, rather than employing

complicated gyros and thrusters to control its position.

"Usually, the reason for a satellite is its payload. But we are doing things backward. Our purpose is to get the experience of designing the satellite, so what it carries is of secondary importance. However, we've tried to come up with a payload that will be interesting and worthwhile," said Christopher Kitts, a graduate student in mechanical engineering.

The payload the students have agreed upon is a digital camera, voice synthesizer and global positioning satellite system receiver. The GPS receiver will allow student controllers to determine the satellite's position. Simple photocells will determine when the camera is pointing toward the Earth. That will allow the Logitech digital camera to snap images of different parts of the globe that will be transmitted by radio to interested ham radio operators.

According to Kitts, participants hope that the pictures and synthesized messages from the satellite can be used in elementary schools, middle schools and high schools to help interest students in science.

[Info via Axel, CE3AFC]

* FO-20 MALFUNCTION *
==========
FO-20 command station had confirmed that the FO-20 satellite has experienced a malfunction. The operating schedule previously announced has been cancelled. More details will be available next week.

[Info via Kazu Sakamoto, JJ1WTK]

* RS-12 NEWS *
==========
Bandi, HA5WH reports that his friend, Sanyi, XU7VK is active on RS-12 from Cambodia and is looking for contacts. XU7VK is active during his local daytime hours and is using CW.

* OSCAR-11 NEWS *
==========
During a conversation with Doug, G0SYX at the Dayton Hamvention, Eric, WB1HBU was informed that UoSAT-OSCAR-11 now has its S-band beacon transmitting continuously on 2401.5 MHz.

[Info via Eric, WB1HBU]

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
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Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

698. MONTHLY POSTING: Ham Satellite FAQ

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 17:32:31 UTC
From: stephen@PROBLEM_WITH_INEWS_GATEWAY_FILE
Message-ID: <CpJq28.1nI@boi.hp.com>
Source record: 27549
Cross-posted to: rec.radio.amateur.space,rec.radio.info

REVISION: 9 MAY 1994

CONTENTS:

Foreword - my ramblings
Bibliography - list of sources and how to get more information
Modes - common satellite operating modes
Satellites - descriptions and background history of common satellite
Antennas - discussion of what works best
Preamps - discussion of what is needed
Rigs - popular satellite rigs and features
Accessories and Other Stuff - things that make satellte operation easier
Frequencies - list of most hamsats with uplink/downlink freq/modes
Aliases - list of satellite common names with their other aliases

FOREWORD:

Having recently started to get into Satellites, I asked MANY people what it took to get started and what to do. I found few people who could offer all the information necessary to start. I have attempted to compile this information for future newbies. If I have missed something, please ask and I will attempt to add it to the collection. Any comments can be sent directly to me, stephen@mail.boi.hp.com. Copies of this article should be available in the following locations:

oak.oakland.edu:/pub/hamradio/docs/faq
ftp.cs.buffalo.edu:/pub/ham-radio
Clear Skies BBS (608)249-7130

Also, if you really want to get serious about satellites, I would STRONGLY recommend joining AMSAT to help promote the satellite hobby. AMSAT is a volunteer organization that works for the interests of amateur satellites. Dues are only US$30 per year and you will receive a subscription to "The AMSAT Journal". For US$80, you will receive first year dues and a copy of Instant Track computer tracking software which is a top-notch program. Instant Track was donated to AMSAT by its author and its sales account for a considerable portion of AMSAT's income. AMSAT-NA, 850 Sligo Avenue, Silver Spring, MD 20910-4703. (301) 589-6062. Credit cards welcome.
NOTE: I am in no way connected with AMSAT-NA, other than I have found their publications quite useful.

BIBLIOGRAPHY:

The following text was compiled from the following sources and from comments from many operators:

* "How to use the EZSATS pass tables by N9LTD" and "Hamsat aliases" reprinted with permission. Full text, tables, and lots of other useful information can be obtained by sending a SASE to David Mullenix N9LTD, 2052 Brentwood Pky, Madison, WI 53704 or call the Clear Skies BBS at (608)249-7130.

* "Amateur Radio Satellite Frequencies" This file can be obtained from the ARRL e-mail server. For information on the server, send an e-mail message to info-serv@arrl.org with 'HELP' in body of message.

* "Summary - Getting onto the Hamsats" This was an article posted to rec.radio.amateur.misc newsgroup by Stephan Greene (sgreene@access.digex.com) on 20 Mar 1992. The article is also available via anon ftp from ftp.cs.buffalo.edu or Australian mirror at grivel.une.edu.au as file pub/hamradio/ham_sat_sum.

* "An Amatuer Satellite Operation Upgrade Path" from the AMSAT Journal, September/October 1993, pp. 24-26.

MODES:

The combination of uplink freq, downlink freq, and transmission mode are all lumped together into standardized satellite MODES. Here is a list of common satellite modes used by satellites covered by this article:

A - This mode requires a 2 meter SSB/CW trasmitter and a 10 meter SSB/CW receiver and supports CW and voice.

B - This mode requires a 70 cm SSB/CW transmitter and a 2 meter SSB/CW receiver and supports CW and voice. Some satellites also support RTTY and SSTV in this mode.

K - This mode requires a 15 meter SSB/CW transmitter and a 10 meter SSB/CW receiver and supports CW and voice. This mode is unique in that it can be done with a simple HF rig.

JA- This mode stands for J Analog and requires a 2 meter SSB/CW transmitter and a 70 cm SSB/CW receiver and supports CW, voice.

JD- This mode stands for J Digital and requires a 2 meter FM transmitter and and a 70 cm SSB/CW receiver and supports packet.

S - This mode requires a 70 cm SSB/CW transmitter and a 2.4 GHz SSB/CW receiver and supports CW and voice. Many people use a 2.4 GHz to 2 meter converter with a 2 meter SSB/CW receiver instead of buying a 2.4 GHz SSB/CW receiver.

T - This mode requires a 15 meter SSB/CW transmitter and a 2 meter SSB/CW receiver and supports CW and voice.

Some satellites have dual modes that operate simultaneously. For example, AO-13 can operate in mode BS which means that it can do both mode B and mode S simulaneously. Other common dual modes are KT and KA.

Also, satellites have 3 basic types of retransmissions: beacon, transponder, and repeater.

Beacon - Most satellites have a fixed Morse beacon at the lower end of the satellites band-pass transponder. This is useful to detect when the satellite has crossed the horizon and is in range for operation. It can also be used to determine dopler shifts.

Transponder - A transponder is a band-pass repeater. It accepts a range of frequencies on the input and retransmits the entire range on the output. All offsets withing that range are preserved. NOTE: since the satellite is transmitting many signals at the same time, it is dividing its output power amongst all of these signals. If someone transmits a very powerful signal into the satellite, it will spend most of its power retransmitting that signal and all of the other signals will drop in power. This is NOT a way to earn friends and people who overpower the satellites input are called "alligators" and are not very popular.

Repeater - This closely resembles a land-based repeater. It listens for signals on one frequency and retransmits it on another frequency. All satellite repeaters (and transponders) are full duplex, meaning you can (and should) listen to you signal on the downlink (with headphones) while you are transmitting.

SATELLITES:

Some satellites are easier to work than others. The satellites that follow can be operated fairly easily and are referred to by some as the Easy Sats. What follows is a breif description of each satellite. A summary list of operating frequencies is included later.

Mir

Mir (promounced "mere" - "Peace" in Russian) is the Russian Space Station. It's been in orbit since 1986. All recent Russian Cosmonauts have been hams and have callsigns with "MIR" in them, such as U2MIR. Mir has 2-meter equipment on board and they operate packet and voice on 145.55 MHz. (This is the same freq as the Space Shuttles.) The cosmonauts also have a digital voice recorder which can repeatedly transmit voice announcements.

The best way to get a QSL card from Mir is to connect to their TNC's mailbox, R0MIR-1, (That's R Zero MIR) leave a message AND GET A MESSAGE NUMBER. You must have the message number to qualify for a QSL. The TNC is often busy because amatuers forget to disconnect before Mir goes under their horizon. In a case like this, try connecting to yourself or a friend VIA R0MIR. And if you hear a heavily accented voice calling CQ, by all means say hello!

70 cm and ATV gear is being prepared for future flights!

QSL Address:
Sergei Samburov (RV3DR)
Prospect Kosmonavtov. d.36, kw.96
Kaliningrad City, MOSCOW 141070, RUSSIA.

Sergei can also be reached via packet radio as RV3DR @ RK3KP.#MSK.RUS.EU

A special note on caculating Mir's orbit: Mir is big and it's in a low orbit. This means that there's a lot of atmospheric drag and it has to fire

its rockets every month or two to boost itself back up or it would have re-entered and burned up long ago. Unfortunately, whenever this happens, it throws off all pass predictions. When this happens, Mir will arrive LATER than predicted, so if you tune to 145.55 and nothing happens at the predicted time, keep waiting, it may be along in 10-30 minutes.

SEEING MIR: Mir is also the only EZSAT that can bee seen. Mir is very big, about the size of a semi-trailer, and when it comes over just after sunset or just before sunrise, you can often see it go by. This is because Mir will still be in sunlight whil you're in the earth's shadow. In these cases, Mir looks like a very bright star gliding acress the sky. It's a beautiful sight and well worth looking for. It's best to use a tracking program set to VISUAL to find visible passes. The best such programs will even draw you a star map and show you Mir's path across it. Don't forget to tune to 145.55 when you see it. Also, don't forget to get on the local repeater and tell people when you spot it so that others can share in the fun.

RS-10/11, RS-12/13, OSCAR-21(RS-14)

These three satellites are all in 600 mile high polar orbits, which carry them over the US six to eight times a day for 10-18 minutes at a time. They all have orbital periods of about 95 minutes and we typically get two sets of three or four passes spaced 95 minutes apart. The two sets of passes are spaced 12 hours apart and their passes come a little earlier each day because their orbits don't take quite exacly 95 minutes.

These satellites all have a coverage circle about 4000 miles in diameter, so when they're about the horizon, you can use them to work hams anywhere in the conteinental US, Canada, Alaska, Mexico, Central America, South America down to the Equator, the Caribbean, Greenland, Iceland and parts of Scandinavia. Eastern hams can work Europe and the West can work Hawaii.

All of these satellites are in boxes that are bolted to larger Russian satellites and draw their power from the large satellite's solar cells. They are VERY easy to hear and fairly simple to work.

OSCAR-21

My favorite satellite. This is a German/Russian radio that uses a Digital Signal Processor (DSP) chip and it is Flexible with a capital "F"! It was launched in January, 1990 configured as a linear translator which received a band of 70 cm CW and SSB signals and relayed them on 2 meters. The bird was, to put it mildly, under-utilized. Then in 1992 the DSP chip was reprogrammed in orbit into a cross band FM repeater! If you've been wondering if DSP is as powerful as you've heard, now you know! In the past year, it's telemetry has been re-programmed from an obscure format to standard 1200 baud packet. WEFAX pictures (which are uploaded by teh ground controllers) were added in December 1993. (This is the same format used by many weather sats and short wave weather stations.)

OSCAR-21 has an input frequency of 435.016 MHz, but 435.015 works just fine. It's output frequency is 145.987 MHz, but 145.985 or 145.990 will recieve it quite well. It has a strong transmitter and a ground plane antenna and most

HTs have no trouble picking its signals up when it passes over. Mobiles and base stations with omni antennas will receive it full quieting. You can get into this bird with 20 watts and a six element beam antenna. I mount my beam on a photo tripod next to my car and run coax to my dual band mobile. You have to point the beam accurately, so I take a list of altitude and azimuth bearing generated by simple tracking software out with me and re-point the beam once a minute. In one summer, I worked the east and west coasts, several Canadians, Texas and Guantanamo Bay, Cuba before fall's cold weather drove me indoors.

Some OSCAR-21 tips: you can hardly get a word in edgewise during "prime time" opening passes. Try the late night passes instead, they're much less crowded. OSCAR-21's transmit and recieve polarity rotate constantly during a pass. Mount your beam so you can easily rotate it for the best signal. Remember, all these ham sats are full duplex, so you can and should monitor your signal on the downlink. (Use headphones.) Turn the beam for minimum noise. You'll probably have to modify your dual band rig to get it to transmit on 435.015. BE CAREFUL beacuse FM is generally NOT appreciated below 440 MHz. Also, the mod may allow you to transmit out of band, which is a real no-no.

OSCAR-21 is also known as RS-14, AO-21 and Rudak-2. It's bolted to a satellite called INFORMATOR-1, which is often abbreviated INFORMTR-1. It's NORAD ID number is 21087. Be careful, the rocket booster that launched the satellite is still up there and it's named INFORMTR-1 R/B in some element sets. Your tracking program may find it instead of the satellite if you're not careful.

RS-10/11

This is probably the easiest satellite to work of them all. It has an incredibly sensitive receiver that can pick up the faintest two meter signal and relay it on ten meters. There are documented examples of people having QSOs on RS-10/11 by clicking Morse on HTs with rubber duck antennas! I guarantee you that your HT can put a useable signal into RS-10/11, I've done it myself. WARNING: if you try this, disable the microphone so you don't transmit any FM sidebands and turn your CTCSS (PL) OFF!

RS-10/11 (Radio Sputnik) is for CW and SSB signals, so an all mode 2 meter rig is ideal for transmitting to this bird. The input bandpass is from 145.860 - 145.900 and the output freqs are from 29.360 - 29.400 MHz. There is also a morse beacon at 29.357 MHz.

RS-10 is also equiped with a feature called ROBOT. The ROBOT is an automatic on-board QSO computer. To work it, send the following at about 15-20 wpm on 145.82 MHz (an automated keyer works best):

RS-10 DE (your call) AR

If the ROBOT hears you, it will respond on the 29.403 MHz downlink with:

(your call) DE RS-10 QSL NR (number) OP ROBOT TU USW QSO (number) 73 SK

If you want a QSL card, try sending the QSL number the ROBOT sent back to you on your QSL (along with an SASE and return postage) to:

Andrey Mironov
UL Vvoloshinoj. D11. KV72.
141000 Station Perlovskaya
Moscow, Russia

RS-12/13

A cousin to RS-10/11, RS-12/13 is also a 40 KHz wide linear transponder. However, this bird is unique because its input frequencies are in the fifteen meter band! This is also the only ham sat in the sky that requires more than a code free technician license to work it, because its input band is from 21.210 - 21.250 MHz. This straddles the Advanced and Extra portions of the 15 meter band. Its output freqs are from 29.410 - 29.450 MHz. Because of skip, this satellite can often be heard and worked when it's below the horizon! At least one person has earned DXCC on this satellite! RS-12/13 is bolted to yet another Russian satellite and its NORAD ID is 21089. RS-12/13 also has a ROBOT mode like its brother RS-10/11.

DOVE

DOVE is short for Digital Orbiting Voice Encoder and is a transmit-only hamsat (it has no user accessible receiver). Built in Argentina, DOVE was launched in 1990 as a good will satellite to introduce children and newcomers to amateur satellites. It was originally intened to transmit digitized voice messages that could be picked up by students with simple receivers. Unfortunately, the digital voice hardware and software has been a constant source of problems since launch. Atempts to get DOVE to works properly are proceeding as this is written, so the best bet is to tune your 2-meter rig or scanner to 145.825 MHz and see what the bird is up to currently. Be ready for Morse, standard 1200 baud packet or (with luck) digitized voice messages. The signals are strong enough so that an HT with a rubber duck will hear it when it's overhead, although ground plane antennas will give better coverage when the bird is near the horizon.

AO-10

Known as Phase 3-B before it's launch by the European Space Agency in June, 1983, this satellite was designed for launch into a high elliptical orbit. This orbit, called "Molniya" orbit, places the satellite over one spot on the Earth for up to several hours at a time. This orbital configuration also allows for consistent, long haul DX communication because the satellite is visable to roughly half the Earth! This orbit virtually eliminates the frantic "hurry up" style of operation. But such a luxury is not without cost. At the farthest point in the Molniya orbit, this satellite is over 25,000 miles away from the Earth, meaning high gain antennas and higher power levels are required to get a workable signal up and through the bird. Also, even though radio waves travel at the speed of light, the over 50,000 mile round trip creates a signal path delay of about 1/4 second on the downlinked signal. It takes some time for satellite operators to get used to simultaneously speaking and listening to their own voices returning in

their headphones a quarter second later.

The first Phase 3-A launch ended in disaster when the Ariane booster malfunctioned, dropping the bird in the Atlantic. Phase 3-B, later to become OSCAR 10, met with somewhat better fortune, surviving the launch and first burn of its "kick motor" just fine. However, we later learned that the booster had apparently bumped OSCAR 10 shortly after separation which damaged one or more of its antennas and also caused other internal injuries because the second and subsequent kick motor firings never happended. This left OSCAR 10 in a lower inclination elliptical orbit. This meant that the bird didn't have the intended operational coverage nor enough solar panel illumination to sustain full operations. So today, OSCAR 10 is "sort of" operational. It is stuck in mode "B" with only its omnidirectional antennas working and it is slowly tumbling. Users are requested to listen for AO-10's 145.810 MHz beacon for a steady, unmodulated carrier before operating the bird. If the beacon is raspy or if your downlink signal appears to be shifting in frequency, users are asked NOT to use the transponder until it has a chance to slowly recharge its batteries.

AO-13

Launched in June, 1988, OSCAR-13 is now carrying the bulk of the long haul DX available via amateur satellite. It is the current--and much improved--brother to OSCAR 10. However, unlike OSCAR 10, it did managed to achiieve its "Molniya" orbit. OSCAR 13 also has the ability to automatically select transponders for each mode at different points in its orbit. This helps optimize the mode in use with its corresponding downlink antenna gain. OSCAR 13 did have some problems, however. It had a RUDAK experiment onboard that failed shortly after launch. Also, in June 1993, the 70 cm downlink transmitter ceased to function, putting an end to Mode J and L operation. However, modes B and S are still being supported and mode S is becoming increasingly popular. Also, AO-13's batteries are beginning to show signs of age and its orbit it deteriorating. The progressive effects of previously unknown gravitational interactions between AO-13, the Sun, the Moon and the Earth will all conspire to cause the satellite's re-entry into the atmosphere sometime in 1996.

ANTENNAS:

For AO-13, the consensus is get to get KLMs, Telex/Hy-Gains, or roll-your own, Nobody liked the Cushcraft satellite antennas - they appear to have problems in wet weather. Bigger is also better, if you have the space. Several people mentioned the KLM 22C and 40CX pair as excellent performers (again - you need the room for those long booms!) KE4ZV stated his pair of KLMs (the big ones!) lets him work AO-13 with 3 to 30 watts (hardline feed and rigorous attention to routing the feedlines and cables properly to maintain the antenna patterns helps, too.). Others mentioned the KLM 14C/18C pair as good performers - but you need more power on the uplink.

Telex/Hy-Gain antennas were recommended by several people as a less expensive alternative to KLMs that work almost as well. There's also M2 (started by an engineer from KLM). While no one who responded uses them,

the information I received from a call to their factory in California suggests they are comparable to slightly better than the KLMs in performance, and about the same in cost. Dave, WB6LFC, said homebrewing antennas is also feasible - it takes work, but attention to detail results in top-notch performance for very little money. Finally, Ross, VE6PDQ, reported good results using a pair of Cushcraft 215WBs on receive.

Problems encountered with AO-13 antennas include routing cables and feedlines off the back of the antennas (to preserve antenna patterns), use of fiberglass cross booms, mounting preamps as close to the feedpoint as possible, and long antenna booms drooping. (Gary, KE4ZV, recommends using a rope to brace the boom or stiffening booms and fiberglass masts internally with foam-in-a-can insulation.)

On antenna rotators, it appears the Alliance UD-100 is no longer made, though it should still show up at hamfests. People with long-boom antennas report the Alliance rotator is too weak to move a big array anyway, and recommended Yaesu's elevation-only rotator or their Model 5400 azimuth-elevation unit.

Antennas for the low-altitude satellites appear to be much less critical. J-poles were most frequently mentioned (the design from the AMSAT Journal?), but dipoles, ground-planes, and yagis are also in use. Several people work RS-10 quite well with antennas in the attic. Best results are with steerable antennas, but the high operator workload during a pass (unless the satellite is just grazing your access circle) almost demands computer control of the rotators.

PREAMPS:

You need a preamp for AO-13. (I can hear the downlink after a fashion on a Ringo fed with cheap coax and a 10 dB preamp in the shack, but it's not communications quality reception!) Only two people mentioned a specific brand name (Advanced Receiver Research and the unit included with the Ten-Tec 2510), so I assume almost any GAsFET preamp in the 20dB gain class is adequate. THE PREAMP MUST (almost always) BE MOUNTED AT THE ANTENNA (check the discussion in Chapter 9 of the Satellite Experimenter's Handbook and you'll see why!). KE4ZV recommends mounting the preamp AT the antenna feedpoint, if your elevation rotator can handle the unbalanced load.

While no one mentioned it (maybe it's obvious), if the antenna is used to transmit (say Mode J) as well as receive (on Mode B, for example), the preamp MUST either include RF-sensed switching, or be switched out of the line before you transmit. TRANSMITTING INTO AN UNPROTECTED PREAMP WILL DESTROY IT INSTANTLY!

Preamps also seem to help on RS-10 (especially with older HF rigs) and on the Pacsats. It seems to be a case of "try it, and get a preamp if it looks like it would help").

RIGS:

Three radios were mentioned by name - Yaesu FT736 (and it's predecessor, the 726 with satellite module), Kenwood TR751 (a mobile-capable 2 meter multimode), and Ten-Tec's 2510. The Ten-Tec unit is out of production. The few units left are selling for about $300-350. I'm sure other multi-mode radios, and setups with converters and transverters work well, too - it's just that no one mentioned any by name.

Power output required is a function of the satellite, your antennas, and how badly you want to communicate. [QRP on the satellites is just like QRP on HF - you need good antennas and feedline, you have to pick optimal passes, and skilled operators at both ends are needed. Given the apparent "calmer" operating style on AO-13, QRP is probably easier there than on 20 meters!]

Anyway -about power for AO-13. 3-30 watts will work if you have top-notch antennas (KE4ZV). KC7IT uses 50-100 watts (Ten Tec 2510, Mirage D1010 amplifier, KLM 14C/18C fed with 50 feet of 9913). Both KE4ZV and KC7IT use Mirage D1010 amplifiers on 70 cm when they need a little extra power. For an "optimum station", WA5ZIB recommends 60 watts on 70 cm and 80 watts on 2 meters for AO-13, assuming good antennas (Telex/Hy-Gain or better) and feedlines, and 20 watts to a 5' dish for Mode L. Andy emphasized that you can get by and have lots of fun with much less!

For Mode A, WA5ZIB said 6 watts to the AO-13 2 meter antenna will work well. People using omnis report success with the Pacsats running 50-70 watts to a J-Pole (N5VGC). Several people said they (or someone they know) have no trouble using RS-10 at lower power (10-25 watts) with simple, omnidirectional antennas. Again, it's a case of "try it and see if it works."

There was unanimous consensus that the receiving quipment (antenna, preamp, feedline, and receiver) is more important than the transmit equipment. Running more power "to hear yourself" is frowned upon, to say the least! It's also important to be able to vary uplink power to adjust to specific conditions. Both the Ten Tec 2510 and the Yaesu 736 have continuously variable power output (I guess the rest of us just have to fiddle with the drive controls on our rigs!).

ACCESSORIES AND OTHER STUFF:

You need a PSK modem to use the Pacsats. PacCom makes fully assembled units, either already integrated with their own TNC, or as a board you install in your TNC-2 clone. They make similar 9600 bps units for accessing UO-22. The downlink receiver (on 70 cm) should be capable of being tuned by the PSK modem's AFC lines. Newer radios can use the up/down lines from the microphone jack or an accessory connection on the rear panel. Older radios must be modified, or be tuned manually. N5VGC told me he sees about 20KHz of doppler on an AO-16 pass, and that without automatic tuning, operator workload is too high to do much else besides tune the receiver!

Just about any radio suitable for packet on 2 meters will work for AO-16, WO18, and LU-19. To run 9600 bps on UO-22, modifications to bypass the microphone and speaker's audio processing circuits are required. I've seen some reports on rec.radio.packet and in the various Hamsat columns that

differences between UO14 and UO-22's transmitters make UO-22 more difficult to copy. (I'll worry about that problem later - I'll start with AO-16 and LU-19 first!)

No one mentioned computers - again, it must be obvious (also, we're "talking" using computers!). They're handy, and you need one IN THE SHACK when working the Pacsats or for automated, real-time control of antenna rotators (useful for low altitude satellites).

Other operator aids mentioned, or I thought of on my own: If your radio can't slave uplink and downlink tuning (Ten Tec 2510 and Yaesu 736 can), you need something to help convert between uplink and downlink frequencies (and account for doppler shift and calibration errors on the radios' frequency readouts). A cardboard slide scale or dial will work. I'm thinking of programming my HP48 to do the conversion for me. You need something like this to know where to tune on the uplink to hear a given downlink frequency.

Software to track satellites and predict passes. There are many programs that work. Price ranges from free to $70 for state-of-the-art QuickTrack or InstantTrack (available from AMSAT). Special software is also needed to use the Pacsats, and to interpret telemetry data. This software is also available from the usual ham sources, and from AMSAT (BTW, software sales support the amateur satellite program!)

Polarity switchers optimize antenna performance by allowing switching antenna feeds from RHCP to LHCP as the need arises. They are a very useful add-on, but don't appear essential.

Equipment to measure power output, SWR, transmit frequency - all useful (see - satellites are not that different from HF!).

FREQUENCIES:

Amateur Radio Satellite Frequencies (as of January 1994)

Designation Frequencies Transponder/ Mode
Beacon
AO-10
Downlinks 145.810 B B
145.825-.975 T B
145.987 B B (Usually off)
Uplinks 435.027-.179 T B

RS-10
Downlinks 29.357 B A
29.360-.400 T A
29.403 B (Robot) A
145.857 B T/KT
145.903 B (Robot) T/KT
Uplinks 145.860-.900 T T/KT
145.820 B (Robot) T/KT

RS-12
Downlinks 29.408 B K
29.410-.450 T K
29.454 B (Robot) K
145.913 B T/KT
145.959 B (Robot) T/KT
Uplinks 21.210-.250 T K

AO-13
Downlinks 145.812 B B
145.825-.975 T B
145.985 B B (Usually off)
435.651 B L/JL
435.677 RUDAK
435.715-6.005 T L/JL
2400.664 B S
2400.711-.749 T S
Uplinks 435.423-.573 T B/S
435.601-.637 T B/S

AO-16
Downlinks 437.02625 T/B J Dig. (1200b SSB) (secondary)
437.05130 T/B J Dig. (1200b Rai. Cos SSB) (pri)
2401.14280 B 1200 bps SSB (Usually off)
Uplinks 145.900 T 1200 bps AFSK FM Digital
145.920 T 1200 bps AFSK FM Digital
145.940 T 1200 bps AFSK FM Digital
145.960 T 1200 bps AFSK FM Digital

DO-17
Downlinks 145.82438 B 1200 bps AFSK FM or Dig Voice
145.82516 B 1200 bps AFSK FM or Dig Voice
2401.22050 B 1200 bps BPSK (SSB) (usually off)
Uplinks None

WO-18
Downlink 437.10200 B 1200 bps BPSK, J Dig (Telem, Image)
Uplink None

LO-19
Downlinks 437.125 T/B J Digital (secondary)
437.127 B CW
437.154 T/B J Digital (primary)
Uplinks 145.840 T 1200 bps AFSK FM Digital
145.860 T 1200 bps AFSK FM Digital
145.880 T 1200 bps AFSK FM Digital
145.900 T 1200 bps AFSK FM Digital

FO-20
Downlinks 435.795 B J Analog
435.800-.900 T J Analog (See below)
435.910 T/B 1200 bps BPSK (SSB), J Digital
Uplinks 145.850 T 1200 bps AFSK FM Digital

145.870 T 1200 bps AFSK FM Digital
145.890 T 1200 bps AFSK FM Digital
145.910 T 1200 bps AFSK FM Digital
OR 145.900-6.00 T CW/SSB (Alternates with above
every other week. Changes on
Wednesdays)

AO-21
Downlinks 145.852-.932 T CW/SSB
145.866-.946 T CW/SSB
145.985 Repeater FM (Alternates with voice
bulletins and telemetry)
Uplinks 435.022-.102 T CW/SSB
435.601-.637 T CW/SSB
435.015 Repeater FM (See above)

UO-22
Downlink 435.120 T 9600 bps FM Digital
Uplinks 145.900 T 9600 bps FM Digital
145.975 T 9600 bps FM Digital

KO-23 (KITSAT)
Downlink 435.175 T 9600 bps FM Digital
Uplinks 145.850 T 9600 bps FM Digital
145.900 T 9600 bps FM Digital

Mir
Downlink 145.550 T/Robot (Packet mailbox. Alternates
with simplex FM voice QSOs
occasionally)

KO-25 (KITSAT-B)
Downlink 435.175/436.500 MHz 9600 bps FSK FM Digital
Uplink 145.870/145.980 MHz 9600 bps FSK FM Digital

AO-26 (ITAMSAT)
Downlink 435.867 MHz 1200 bps PSK Digital
Uplinks 145.875 MHz 1200 bps FM Digital
145.900 MHz 1200 bps FM Digital
145.925 MHz 1200 bps FM Digital
145.950 MHz 1200 bps FM Digital

AO-27 (AMRAD)
Downlink 436.798 MHz Analog FM voice/9600 bps FSK FM
Uplink 145.850 MHz Analog FM voice/9600 bps FSK FM

PO-28
Uplink 145.975 MHz JD 9600 bps FSK (Primary)
145.925 MHZ JD 9600 bps FSK (Secondary)
Downlink 435.075 MHz JD 9600 bps FSK (Primary)
435.050 MHz JD 9600 bps FSK (Secondary)
Note: PoSat will be available to all radio amateurs from January 28, 1994.

ALIASES:

NORAD Common Name [Aliases] (Parent satellite)
----- ----------- ------------------------- ------------------
14129 AO-10 [OSCAR 10, Phase 3B]
14781 UO-11 [OSCAR 11, UO-11, UOSAT-B, UOSAT 2]
16609 Mir
18129 RS-10/11 [RS-10] (COSMOS 1861)
19216 AO-13 [OSCAR 13, Phase 3C]
20437 UO-14 [OSCAR 14, UOSAT-OSCAR 14]
20438 UO-15 [OSCAR 15, UOSAT-OSCAR 15]
20439 AO-16 [OSCAR 16, Pacsat, Microsat-A]
20440 DO-17 [OSCAR 17, DOVE, Microsat-B]
20441 WO-18 [OSCAR 18, WEBERSAT, Microsat-C]
20442 LO-19 [OSCAR 19, LUSAT, Microsat-D]
20480 FO-20 [Fuji-OSCAR 20] (JAS 1-B)
21087 AO-21 [OSCAR 21, RS-14, RUDAK-II] (INFORMTR-1 or INFORMATOR-1)
21089 RS-12/13 [RS-12] (COSMOS 2123)
21575 UO-22 [OSCAR 22, UoSAT, UOSAT-F]
22077 KO-23 [OSCAR 23, KITSAT A]
22654 ARSENE
22825 AO-27 [OSCAR 27, AMRAD] (EYESAT-1)
22826 AO-26 [ITAMSAT, IO-26]
22829 PO-28 [POSAT, POSAT 1]
22830 KO-25 [KITSAT B]

____ ____
| / /_ __\ | Disk Stephen Holmstead All comments (c)1994
| | / / /_/ | | Memory stephen@mail.boi.hp.com Opinions are mine,
|___\ / /___| Division Fax: 208/396-6858 not my employer's.

699. NARS Emerg. TFC NET Info.

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 18:31:18 UTC
From: Edward.Addy@datag.mmbbs.mn.org
Message-ID: <a83_9405091400@mmbbs.mn.org>
Source record: 27554

Re: Bulletin For Immediate Release on all Military & Radio Boards.
Date: May 8, 1994
From: Edward Addy/KE0EG/AAM6RD/NACEC.HQ

* *
The North American Center for Emergency Communications, Inc.(NACEC)
Affiliate
Radio
System
(NARS)

NACEC is being developed to serve the emergency communications needs of
Military Families, Disaster Victims and Disaster Relief Operations. Thi
being done by building one of the most powerful commercial grade radio
communication centers in North America and making it services available
new tool to support the communications needs in these areas. NACEC
accomplishes this mission by maintaining its communications center's abi
to operate on and support radio communications on the Commercial, Milita
Federal Gov., State Gov. and Amateur Radio parts of the RF spectrum.
NARS is the Amateur Radio traffic support network for NACEC.

NARS is being developed as a high speed emergency traffic network consis
of trained and dedicated radio operators. Training & Testing are provid
during weekly radio nets that are conducted on amateur radio frequencies
NARS is intended for only those amateur radio operators that are serious
about helping others.

All MARS (Military Affiliate Radio System) members of any branch of
MARS are encouraged to participate. NARS is being fashioned after the
Army MARS network. It is hoped that NARS will help provide a better
understanding (and remove misconceptions) of the value of MARS,
while at the same time creating a system of combined Amateur and MARS
operators to handle emergency traffic. It is also hoped that NARS will
also create the opportunity for many new amateurs to join and increase
the membership of the various MARS programs. NARS membership currently
consists of about 25% MARS and 75% Non-MARS operators.

NARS Information & Training Nets are directed nets. All members of
the Amateur Radio Community are welcome to participate.

NARS nets meet on the following weekdays and times:

Week Day Net ID Time Freq. Mode

Sundays: NARS/A 24:00 UTC/7:00 PM LST 3.860 LSB
NARS/B 23:00 UTC/6:00 PM LST 7.262 LSB
NARS/C 22:00 UTC/5:00 PM LST 14.347 USB

** All HF nets meet +/- QRM and band usage.

Thursdays: In the Minneapolis & St.Paul Minnesota Area Only.
This net is currently held on the TCFMC repeater.

NARS/D 02:00 UTC/9:00 PM LST 146.76 FM
* LST is Minnesota Local Standard Time.

* *

Information on the NARS program can be requested from the NCS on any NAR

An Information Package with Membership App. will be provided by mail.

Specific questions regarding NARS or NACEC should be directed to:

Mr. Edward Addy
NACEC
NARS Network
P.O. Box 23057
Minneapolis, MN 55423

Office Number is: 612-798-4269

* *

700. Please Help Me

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 20:16:54 UTC
From: mmjjmm@post.its.mcw.edu
Message-ID: <2qm5nm$mjb@post.its.mcw.edu>
Source record: 27550

I am interested in getting started in satellite communications and would
like to get more information. If you have any files or information that
you could forward I would be greatful.
73 Mike N9WJV
--
Michael J. Malloy Amateur Radio N9WJV
Medical College of Wisconsin Compuserve 70334,3563
Milwaukee, Wisconsin Internet mmjjmm@post.its.mcw.edu

701. AO-27 help?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-09 23:53:37 UTC
From: greg@core.rose.hp.com
Message-ID: <CpK7pE.Hz3@icon.rose.hp.com>
Source record: 27551

Hi, folks,

Can someone walk through a typical pass of AO-27 for me? I am having a lot of trouble with this one, more than I would have expected from the comments I've heard.

Information that would be helpful:

downlink frequency at the start, middle, end of pass
uplink freq, how to find yourself
approximate signal strength expectations ("weaker than AO-21, but you don't need a pre-amp", or some such statement)
uplink power
antenna requirements

I have about 30 watts into a 5 element beam for the uplink, and an 8 element Quagi for the downlink. Cable runs are ~50 feet of RG-8 (I know this isn't ideal, but I should hear *something*).

Thanks,

Greg KD6KGW

p.s. The same info for FO-20 would be OK too, but I expect AO-27 is easier. I haven't been able to hit AO-21 yet either, but at least I can hear it clearly.

702. Re: Please Help Me

Newsgroup: rec.radio.amateur.space
Date: 1994-05-10 00:19:13 UTC
From: greg@core.rose.hp.com
Message-ID: <CpK8w1.I8I@icon.rose.hp.com>
Source record: 27552

Michael Malloy (mmjjmm@post.its.mcw.edu) wrote:
: I am interested in getting started in satellite communications and would
: like to get more information. If you have any files or information that
: you could forward I would be greatful.

Check out QST. A few (less than 12) months ago they had an article about the "Easy Sats" (RS-10) which talked about the requirements for getting on the air through the birds.

My first setup was fairly modest, but was still good enough to make a number of contacts. Assuming you want to start with Phone on RS-10, you'll need:

An uplink transmitter - 2 meters SSB, 10+ watts, J-pole or ground plane ant.
A downlink receiver - I used my Radio Shack DX-440 shortwave radio. Turn on the BFO to receive the SSB signal. Dipole or long wire antenna.
A computer with a satellite tracking program & a current set of elements.

This will get you into RS-10. Other satellites are harder (i.e. more power, bigger antennas).

Good luck!

Greg KD6KGW

703. Re: Is there a Pacsat/Internet Gateway??

Newsgroup: rec.radio.amateur.space
Date: 1994-05-10 06:55:59 UTC
From: Jeff@kgreen.demon.co.uk
Message-ID: <329147118wnr@kgreen.demon.co.uk>
Source record: 27555

In article: <5k7s8Rl.dentarthur@delphi.com> Jim Corenman <dentarthur@delphi.com>
writes:
>
> This is probably a dumb question, but I've been unable to find the answer
> amongst the packet or satellite faq files, or anywhere esle I've looked.
> Frequencies and modes I found, but is it possible, on a routine basis,
> to pass messages between the packet birds and internet e-mail?
>

It is possible, and it is even implemented by both VITA and SatelLife on the
non-amateur birds, but I think that the regulatory problems have kept anyone from
doing it on the amateur packet satellites.

Jeff Ward

704. New AMSAT-NA stuff

Newsgroup: rec.radio.amateur.space
Date: 1994-05-10 14:59:20 UTC
From: "Walter K. Daniel KE3HP" <wk02593@worldlink.com>
Message-ID: <2977667927.1.wk02593@worldlink.com>
Source record: 27558

Some new AMSAT-NA stuff was mentioned in the ANS bulletin this past weekend. I spoke with Martha this morning to find price and availability. Everything is in stock, so hurry to your mailbox!

WINSAT, the Windows-based satellite tracking program, is $30 for members

WISP, the Windows-based PB/PG packet software, is $30 for registration. Martha says that the program itself is available from some of the satellites, but you send $30 to AMSAT for registration. If you can't download the program, request a disk when you order a registration number. The program is still being refined, but the registration number will work with new versions.

The AMSAT 25th anniversary patch is $5, the decal is $2

The AMSAT-NA Digital Satellites Guide is $12. This is an update of the Pacsat Beginners Guide and may be revised further in the future.

The new laminated frequency chart is $5

How to Use the Amateur Radio Satellites is $5

The most recent version of Weberware (1.3?) is $30 for members.

Note that these prices include postage for North American addresses. If you live in another part of the world, check with your local AMSAT group for availability of these items.

73, Walt KE3HP

705. bbs

Newsgroup: rec.radio.amateur.space
Date: 1994-05-11 03:14:11 UTC
From: pat.curtis@springsboard.org
Message-ID: <940510221830561@springsboard.org>
Source record: 27560

```
hey pat, welcome to the
springboard- have fun
```

706. Re: Please Help Me

Newsgroup: rec.radio.amateur.space
Date: 1994-05-11 12:12:08 UTC
From: ae517@FreeNet.Carleton.CA
Message-ID: <Cpn0K8.C0r@freenet.carleton.ca>
Source record: 27559

In a previous article, mmjjmm@post.its.mcw.edu (Michael Malloy) says:

>I am interested in getting started in satellite communications and would
>like to get more information. If you have any files or information that
>you could forward I would be greatful.

Have you thought of joining AMSAT? I joined when I first became
interested in satellite ops, and have no regrets. They sent me a very
helpful info package.

AMSAT
Radio Amateur Satellite Corp.
P.O. Box 27, Washington, DC
20044

tel (301) 589 6062

AMSAT: it's more than just a good idea!

de va3rr@amsat.org
--

707. Re:Re: Re APT Wheather

Newsgroup: rec.radio.amateur.space
Date: 1994-05-11 16:16:01 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <CpnBup.LHD@freenet.carleton.ca>
Source record: 27461

In a previous article, peter.henne@gmd.de (Peter Henne) says:

>In article <CpJ3JC.2x1@bbc.co.uk>, boyer@rd.eng.bbc.co.uk (John Boyer)
>wrote:
>
>> Herb Dieben (ag381@FreeNet.Carleton.CA) wrote:
>>
>>
>> : What would be the 'best case' resolution of NOAA's either or VIS / IR
>> : or both.Another way of asking is what number of pixels do their sensors
>> : use?Also while we are at it, what is 'best case' gray scale resolution?
>> : Let mme e know if you can.Or perhaps direct me to a reliable source for
>> : this info.
>> : Thank you, reader!
>>
>>
>> Best case hoorizontal resolution is 4800 pixels per line. The grey scale
>> resolution depends on your convertor.
>>
>>
>> john b
>> john.boyer@rd.eng.bbc.co.uk
>
>Oh, I am in doubt....if you talk about APT.
>Subcarrier is 2400 Hz, AM-modulated max 1600 Hz, 2 Lines/sec
>containing a vis-Line and a Th.IR-line. So we can rely on just
>not very much more than 400 dots per line. This gives a pixel-
>resolution of 7.2 km x 3.6 km (scan-dir x orbit-direction).
>Resolution of greyscale is not better than 1:200 (if you reach that,
>normally your converter will achieve 1:64 or so): APT is an
>analog format.
>HRPT-Resolution is 2048 Pix/lin, 10 Bit depth per channel, a frame
>has 5 channels, 6 frames per second. Resolution is just below 1x1 km.
>10 Bit depth: HRPT is a digital format, you will see the full
>resolution or nothing.
>
>Regards
>Peter
>
Thanks Peter,that was really helpful.
Could you shine some light on the subject of aspect ratio??

Right now I have some 600 pixels on the x_axis(hor) and some 480 on
the y_axis,similar to VGA.This gives me rather distorted images from
NOAA 9 in that North to South is about 50 % stretched relative to

East to West.Is this simply perspective??
>

708. 435 MHZ down converters?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-11 21:54:02 UTC
From: wa4ymz@aol.com
Message-ID: <2qrk5q$2tb@search01.news.aol.com>
Source record: 27462

I'm just about set up for the packet sats with just one exception: I don't have a receive setup. I'm planning to use a TS-670, or possibly a TS-690, HF rig as an IF, but I'll be needing a down converter. Since the satellites seem to down-link on 435.xxx through 437.xxx MHz, I'll need one that will allow switching segments or have a 6M output. I have a mast-mount pre-amp at 70cM, but would like to mount the converter at the antenna to minimize coax signal loss. Is this a big concern if I use the pre-amp? I'd certainly appreciate suggestions and/or observations of the set-up anyone might be using. PS, can't really afford a full blown xcvr for the band at this time unless someone has something for sale or can point me in the right direction. Thanks.

Gary WA4YMZ

709. Re: Is there a Pacsat/Internet Gateway??

Newsgroup: rec.radio.amateur.space
Date: 1994-05-12 13:33:04 UTC
From: hansen@jane.cs.fredonia.edu
Message-ID: <1994May12.133304.21808@penny.cs.fredonia.edu>
Source record: 27463

Jim Corenman (dentarthur@delphi.com) wrote:
: This is probably a dumb question, but I've been unable to find the answer
: amongst the packet or satellite faq files, or anywhere esle I've looked.
: Frequencies and modes I found, but is it possible, on a routine basis,
: to pass messages between the packet birds and internet e-mail?
I'm quite active on the packet birds and I know of no such system. One
of the principle problems with establishing such a system is that the
legally allowed content of messages differs substantially between radio
and the internet and someone would have to monitor each message that was
passed into the radio system. Another problem is the relatively limited
bandwidth on the pacsats, they could easily be swamped with traffic from
internet.

:
: It sounds like it ought to work, in theory, but I have not seen any
: reference to a gateway between a pacsat and anything else, like either
: the 2-meter packet or internet directly.
2 meter packet is a different story. There exist a few digital nodes
that seamlessly bass traffic between the 2 meter system and the
satellites. I wrote the software that does this and operate one of these
nodes.

: The goal is to be able to pass traffic to and from our sailboat from
: offshore in the South Pacific. Going between internet and the terrestrial
: packet network is no problem, but then what?

I believe that one or more of the nodes I mentioned above is in this part
of the world, but whether you would be able to access it from your boat
is another matter. Please bear in mind that these nodes are designed to
let bbs users operate as if they were satellite groundstations, it is not
designed for bbs to bbs traffic. There is an international packet
forwarding system that works via satellite as well, but this works
virtually transparently. Your best bet, assuming you are contemplating
workign the satellites from your ship, might well be to either contact
the satellite forwarding coordinator (I'm not sure who is doing this
these days) and see if you can get special permission to tap into it (I
know this has been done for an occasional maritime mobil before) or to
find someone on the satellites who is willing to pick up your messages
and introduce them into the terrestrial system.

good luck and 73, John

710. Re: 435 MHZ down converters?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-12 21:43:22 UTC
From: mack@ncifcrf.gov
Message-ID: <CppLoA.3z2@ncifcrf.gov>
Source record: 27464

In article <2qrk5q$2tb@search01.news.aol.com> wa4ymz@aol.com (Wa4ymz) writes:
>I'm just about set up for the packet sats with just one exception: I don't have
>a receive setup. I'm planning to use a TS-670, or possibly a TS-690, HF rig
>as an IF, but I'll be needing a down converter. Since the satellites seem to
>down-link on 435.xxx through 437.xxx MHz, I'll need one that will allow
>switching segments or have a 6M output.

I use a hamtronics which comes out at 28MHz, I have the 432 version but its
available in a 435 version. I'm quite happy with it, but according to the
poop I read here, it isn't the greatest thing around. For $100 it's at least
OK, at the circuit board is nicely done for what that's worth.

>I have a mast-mount pre-amp at 70cM,
>but would like to mount the converter at the antenna to minimize coax signal
>loss. Is this a big concern if I use the pre-amp?

Not at all. If you have a 20db gain preamp, then you can afford to have maybe
15db of loss in the coax before you get into trouble. You can use RG-58 on the
way down :-). I have the converter next to the HF receiver.

Note that sending power up the same line as the receive comes down
leaves you open to the one time when the relays don't change over just right
and you blow the preamp. Then you have to go get it off the tower etc. A real
pain. I've spent the extra money for some cheap coax for the receive line and
have one relay in the system at the antenna. If the relay doesn't change in
time for some reason,(and this will happen eventually), then your transmitter
faces an open circuit and the ALC shuts it down and the preamp is safe.

Joe Mack NA3T
mack@ncifcrf.gov

>I'd certainly appreciate
>suggestions and/or observations of the set-up anyone might be using. PS, can't
>really afford a full blown xcvr for the band at this time unless someone has
>something for sale or can point me in the right direction. Thanks.
>
>Gary WA4YMZ

711. Re: 435 MHZ down converters?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 13:26:38 UTC
From: zlau@arrl.org
Message-ID: <1994May13.132638.15515@arrl.org>
Source record: 27466

Joe Mack NA3T (mack@ncifcrf.gov) wrote:
: In article <2qrk5q$2tb@search01.news.aol.com>
: Gary wa4ymz@aol.com (Wa4ymz) writes:

: >I have a mast-mount pre-amp at 70cM,
: >but would like to mount the converter at the
: antenna to minimize coax signal
: >loss. Is this a big concern if I use the pre-amp?

: Not at all. If you have a 20db gain preamp,
:then you can afford to have maybe
: 15db of loss in the coax before you get into trouble.
:You can use RG-58 on the
: way down :-). I have the converter next to the HF receiver.

The best case, using a 0 dB NF preamp and a 0 dB NF converter,
results in a system NF of 1.16 dB due to the coax loss.

The usual rule of thumb is 10 dB more gain than noise figure
(noise figure of converter + coax loss). However, if you
are using a 435 yagi and a 0.4 dB NF preamp, you might need
a ratio closer to 20 dB to take advantage of the low noise
figure of the preamp. On 2 meters, the band is often too noisy
to really take advantage of < 1 dB receiver noise figures.

Back when the rule was formulated, I think anyone who had
a 0.4 dB NF preamp with plenty of gain could have told
you off the top of his head how to calculate system
noise figures.

There is also the receiver overload problem to consider--too
much preamp gain can overload the receiver in areas with
interference. Thus, it may not be practical to have a very
sensitive receiver on some bands.
--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

712. ORBS$133.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 13:56:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-133.o.1994@ampr.org>
Source record: 27467
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-133.O
Orbital Elements 133.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX May 13, 1994
BID: $ORBS-133.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94130.80459721
Element set: 277
Inclination: 27.1382 deg
RA of node: 328.2037 deg
Eccentricity: 0.6020986
Arg of perigee: 177.1779 deg
Mean anomaly: 188.9849 deg
Mean motion: 2.05880044 rev/day
Decay rate: -1.6e-07 rev/day^2
Epoch rev: 8201
Checksum: 313

Satellite: UO-11
Catalog number: 14781
Epoch time: 94129.54582830
Element set: 687
Inclination: 97.7882 deg
RA of node: 146.0792 deg
Eccentricity: 0.0012814
Arg of perigee: 37.7565 deg
Mean anomaly: 322.4528 deg
Mean motion: 14.69203696 rev/day
Decay rate: 2.11e-06 rev/day^2
Epoch rev: 54463
Checksum: 331

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94130.08415553
Element set: 896
Inclination: 82.9265 deg
RA of node: 357.0128 deg
Eccentricity: 0.0012666
Arg of perigee: 123.6132 deg
```

Mean anomaly: 236.6238 deg
Mean motion: 13.72335938 rev/day
Decay rate: -.00000000 rev/day^2
Epoch rev: 34468
Checksum: 295

Satellite: AO-13
Catalog number: 19216
Epoch time: 94126.28995779
Element set: 909
Inclination: 57.8344 deg
RA of node: 254.1456 deg
Eccentricity: 0.7210927
Arg of perigee: 340.7734 deg
Mean anomaly: 2.0051 deg
Mean motion: 2.09721388 rev/day
Decay rate: -3.21e-06 rev/day^2
Epoch rev: 4513
Checksum: 311

Satellite: FO-20
Catalog number: 20480
Epoch time: 94129.46561045
Element set: 682
Inclination: 99.0315 deg
RA of node: 288.6150 deg
Eccentricity: 0.0541341
Arg of perigee: 67.1736 deg
Mean anomaly: 298.5600 deg
Mean motion: 12.83225679 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 19916
Checksum: 315

Satellite: AO-21
Catalog number: 21087
Epoch time: 94129.16206480
Element set: 462
Inclination: 82.9448 deg
RA of node: 171.5920 deg
Eccentricity: 0.0034734
Arg of perigee: 189.9860 deg
Mean anomaly: 170.0610 deg
Mean motion: 13.74538981 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16422
Checksum: 310

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94129.20675370

Element set: 685
Inclination: 82.9235 deg
RA of node: 40.3573 deg
Eccentricity: 0.0027928
Arg of perigee: 215.5272 deg
Mean anomaly: 144.4021 deg
Mean motion: 13.74040261 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16329
Checksum: 285

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94124.94294243
Element set: 251
Inclination: 1.7729 deg
RA of node: 101.4452 deg
Eccentricity: 0.2921942
Arg of perigee: 180.0752 deg
Mean anomaly: 180.1868 deg
Mean motion: 1.42202361 rev/day
Decay rate: -1.20e-06 rev/day^2
Epoch rev: 58
Checksum: 258

/EX

713. ORBS$133.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 13:57:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-133.d.1994@ampr.org>
Source record: 27469
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-133.D
Orbital Elements 133.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX May 13, 1994
BID: $ORBS-133.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94130.22723062
Element set: 987
Inclination: 98.5905 deg
RA of node: 215.5169 deg
Eccentricity: 0.0010604
Arg of perigee: 307.4689 deg
Mean anomaly: 52.5521 deg
Mean motion: 14.29841089 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 22416
Checksum: 301

Satellite: AO-16
Catalog number: 20439
Epoch time: 94128.25497686
Element set: 786
Inclination: 98.5994 deg
RA of node: 214.7636 deg
Eccentricity: 0.0010995
Arg of perigee: 314.3356 deg
Mean anomaly: 45.6923 deg
Mean motion: 14.29894655 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 22389
Checksum: 358

Satellite: DO-17
Catalog number: 20440
Epoch time: 94131.78158643
Element set: 786
Inclination: 98.5998 deg
RA of node: 218.5557 deg
Eccentricity: 0.0010905
Arg of perigee: 302.2194 deg
```

Mean anomaly: 57.7929 deg
Mean motion: 14.30034790 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 22441
Checksum: 321

Satellite: WO-18
Catalog number: 20441
Epoch time: 94130.21693527
Element set: 788
Inclination: 98.6000 deg
RA of node: 217.0145 deg
Eccentricity: 0.0011444
Arg of perigee: 307.1754 deg
Mean anomaly: 52.8393 deg
Mean motion: 14.30009020 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 22419
Checksum: 262

Satellite: LO-19
Catalog number: 20442
Epoch time: 94129.77786521
Element set: 785
Inclination: 98.5980 deg
RA of node: 216.8261 deg
Eccentricity: 0.0011803
Arg of perigee: 308.0215 deg
Mean anomaly: 51.9900 deg
Mean motion: 14.30104622 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 22414
Checksum: 283

Satellite: UO-22
Catalog number: 21575
Epoch time: 94130.18555526
Element set: 489
Inclination: 98.4367 deg
RA of node: 205.4461 deg
Eccentricity: 0.0008631
Arg of perigee: 47.4109 deg
Mean anomaly: 312.7787 deg
Mean motion: 14.36912298 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 14762
Checksum: 320

Satellite: KO-23
Catalog number: 22077
Epoch time: 94130.06403504

Element set: 384
Inclination: 66.0874 deg
RA of node: 359.8032 deg
Eccentricity: 0.0013522
Arg of perigee: 299.1158 deg
Mean anomaly: 60.8506 deg
Mean motion: 12.86285570 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8188
Checksum: 302

Satellite: AO-27
Catalog number: 22825
Epoch time: 94130.24943309
Element set: 283
Inclination: 98.6559 deg
RA of node: 206.4353 deg
Eccentricity: 0.0008740
Arg of perigee: 326.4316 deg
Mean anomaly: 33.6296 deg
Mean motion: 14.27621773 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 3227
Checksum: 302

Satellite: IO-26
Catalog number: 22826
Epoch time: 94129.74262760
Element set: 283
Inclination: 98.6558 deg
RA of node: 205.9657 deg
Eccentricity: 0.0009156
Arg of perigee: 329.5650 deg
Mean anomaly: 30.5000 deg
Mean motion: 14.27724911 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 3220
Checksum: 295

Satellite: KO-25
Catalog number: 22830
Epoch time: 94129.90200328
Element set: 288
Inclination: 98.5572 deg
RA of node: 203.7809 deg
Eccentricity: 0.0010466
Arg of perigee: 291.7365 deg
Mean anomaly: 68.2605 deg
Mean motion: 14.28050062 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 3223

```
Checksum: 287

/EX
```

714. ORBS$133.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 13:58:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-133.w.1994@ampr.org>
Source record: 27472
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-133.W
Orbital Elements 133.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX May 13, 1994
BID: $ORBS-133.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94128.03936387
Element set: 809
Inclination: 99.0568 deg
RA of node: 178.0512 deg
Eccentricity: 0.0014980
Arg of perigee: 337.0876 deg
Mean anomaly: 22.9626 deg
Mean motion: 14.13612360 rev/day
Decay rate: 6.7e-07 rev/day^2
Epoch rev: 48467
Checksum: 332

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94125.88441476
Element set: 707
Inclination: 98.5081 deg
RA of node: 136.1764 deg
Eccentricity: 0.0014034
Arg of perigee: 90.8018 deg
Mean anomaly: 269.4770 deg
Mean motion: 14.24882212 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 39658
Checksum: 328

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94129.86989783
Element set: 285
Inclination: 82.5388 deg
RA of node: 299.0667 deg
Eccentricity: 0.0015532
Arg of perigee: 292.3795 deg
```

Mean anomaly: 67.5722 deg
Mean motion: 13.84714788 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 31705
Checksum: 371

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94130.10094705
Element set: 282
Inclination: 82.5422 deg
RA of node: 350.6395 deg
Eccentricity: 0.0017952
Arg of perigee: 2.3151 deg
Mean anomaly: 357.8054 deg
Mean motion: 13.16967136 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27824
Checksum: 287

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94128.98316958
Element set: 627
Inclination: 99.1712 deg
RA of node: 116.9385 deg
Eccentricity: 0.0010774
Arg of perigee: 244.3291 deg
Mean anomaly: 115.6768 deg
Mean motion: 14.12982863 rev/day
Decay rate: 1.15e-06 rev/day^2
Epoch rev: 28968
Checksum: 343

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94128.61495168
Element set: 283
Inclination: 82.5207 deg
RA of node: 175.4687 deg
Eccentricity: 0.0014032
Arg of perigee: 345.4777 deg
Mean anomaly: 14.5979 deg
Mean motion: 13.84363928 rev/day
Decay rate: 3.9e-07 rev/day^2
Epoch rev: 26221
Checksum: 339

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94132.18115516

Element set: 41
Inclination: 82.5507 deg
RA of node: 294.8736 deg
Eccentricity: 0.0008418
Arg of perigee: 29.4369 deg
Mean anomaly: 330.7138 deg
Mean motion: 13.04416136 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21820
Checksum: 274

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94130.28204066
Element set: 786
Inclination: 82.5442 deg
RA of node: 238.5653 deg
Eccentricity: 0.0014273
Arg of perigee: 254.5376 deg
Mean anomaly: 105.4195 deg
Mean motion: 13.84188298 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 19537
Checksum: 318

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94131.48858561
Element set: 962
Inclination: 98.8363 deg
RA of node: 152.7904 deg
Eccentricity: 0.0016367
Arg of perigee: 108.3552 deg
Mean anomaly: 251.9393 deg
Mean motion: 14.01329946 rev/day
Decay rate: 3.10e-06 rev/day^2
Epoch rev: 18856
Checksum: 333

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94128.53528912
Element set: 794
Inclination: 82.5254 deg
RA of node: 177.5273 deg
Eccentricity: 0.0014067
Arg of perigee: 152.4733 deg
Mean anomaly: 207.7173 deg
Mean motion: 13.83580427 rev/day
Decay rate: 5.4e-07 rev/day^2
Epoch rev: 18227

Checksum: 310

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94129.56143810
Element set: 692
Inclination: 82.5433 deg
RA of node: 196.8958 deg
Eccentricity: 0.0011950
Arg of perigee: 287.1445 deg
Mean anomaly: 72.8364 deg
Mean motion: 13.16461966 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14627
Checksum: 314

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94129.08330723
Element set: 33
Inclination: 98.6209 deg
RA of node: 157.7171 deg
Eccentricity: 0.0013201
Arg of perigee: 354.9703 deg
Mean anomaly: 5.1342 deg
Mean motion: 14.22401393 rev/day
Decay rate: 1.66e-06 rev/day^2
Epoch rev: 15497
Checksum: 268

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94129.53530609
Element set: 701
Inclination: 82.5504 deg
RA of node: 144.0423 deg
Eccentricity: 0.0011555
Arg of perigee: 303.1968 deg
Mean anomaly: 56.8052 deg
Mean motion: 13.16829666 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13137
Checksum: 286

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94128.35976126
Element set: 294
Inclination: 82.5472 deg
RA of node: 237.9869 deg
Eccentricity: 0.0022594

```
Arg of perigee: 341.8215 deg
Mean anomaly: 18.2132 deg
Mean motion: 13.83005246 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 3458
Checksum: 309

/EX
```

715. ORBS$133.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 13:59:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-133.m.1994@ampr.org>
Source record: 27468
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-133.M
Orbital Elements 133.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX May 13, 1994
BID: $ORBS-133.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94128.71536653
Element set: 276
Inclination: 98.6520 deg
RA of node: 204.9673 deg
Eccentricity: 0.0009569
Arg of perigee: 317.8501 deg
Mean anomaly: 42.1930 deg
Mean motion: 14.28022544 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 3206
Checksum: 294

Satellite: MIR
Catalog number: 16609
Epoch time: 94131.09083626
Element set: 592
Inclination: 51.6479 deg
RA of node: 11.9597 deg
Eccentricity: 0.0014199
Arg of perigee: 242.6758 deg
Mean anomaly: 117.2790 deg
Mean motion: 15.58953465 rev/day
Decay rate: 3.958e-05 rev/day^2
Epoch rev: 47026
Checksum: 342

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94132.19674090
Element set: 478
Inclination: 28.4681 deg
RA of node: 107.1507 deg
Eccentricity: 0.0006308
Arg of perigee: 73.5349 deg
```

Mean anomaly: 286.5928 deg
Mean motion: 14.90597492 rev/day
Decay rate: 5.50e-06 rev/day^2
Epoch rev: 2401
Checksum: 303

Satellite: GRO
Catalog number: 21225
Epoch time: 94128.76775695
Element set: 90
Inclination: 28.4612 deg
RA of node: 145.7505 deg
Eccentricity: 0.0004131
Arg of perigee: 127.4927 deg
Mean anomaly: 232.6036 deg
Mean motion: 15.40755304 rev/day
Decay rate: 2.590e-05 rev/day^2
Epoch rev: 5085
Checksum: 286

Satellite: UARS
Catalog number: 21701
Epoch time: 94129.90242006
Element set: 516
Inclination: 56.9885 deg
RA of node: 312.4941 deg
Eccentricity: 0.0005325
Arg of perigee: 97.2687 deg
Mean anomaly: 262.8951 deg
Mean motion: 14.96511937 rev/day
Decay rate: 2.997e-05 rev/day^2
Epoch rev: 14520
Checksum: 316

/EX

716. ORBS$133.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 14:01:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-133.n.1994@ampr.org>
Source record: 27473
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-133.N
2Line Orbital Elements 133.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX May 13, 1994
BID: $ORBS-133.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94130.80459721 -.00000016 00000-0 10000-3 0 2775
2 14129 27.1382 328.2037 6020986 177.1779 188.9849 2.05880044 82016
UO-11
1 14781U 84021B 94129.54582830 .00000211 00000-0 43582-4 0 6870
2 14781 97.7882 146.0792 0012814 37.7565 322.4528 14.69203696544636
RS-10/11
1 18129U 87054A 94130.08415553 -.00000000 00000-0 -16999-4 0 8969
2 18129 82.9265 357.0128 0012666 123.6132 236.6238 13.72335938344689
AO-13
1 19216U 88051B 94126.28995779 -.00000321 00000-0 10000-4 0 9092
2 19216 57.8344 254.1456 7210927 340.7734 2.0051 2.09721388 45136
FO-20
1 20480U 90013C 94129.46561045 -.00000008 00000-0 46937-4 0 6824
2 20480 99.0315 288.6150 0541341 67.1736 298.5600 12.83225679199162
AO-21
1 21087U 91006A 94129.16206480 .00000094 00000-0 82657-4 0 4626
2 21087 82.9448 171.5920 0034734 189.9860 170.0610 13.74538981164221
RS-12/13
1 21089U 91007A 94129.20675370 .00000050 00000-0 36812-4 0 6853
2 21089 82.9235 40.3573 0027928 215.5272 144.4021 13.74040261163290
ARSENE
1 22654U 93031B 94124.94294243 -.00000120 00000-0 00000 0 0 2516
2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202361 582
UO-14
1 20437U 90005B 94130.22723062 .00000037 00000-0 31238-4 0 9879
2 20437 98.5905 215.5169 0010604 307.4689 52.5521 14.29841089224162
AO-16
1 20439U 90005D 94128.25497686 .00000011 00000-0 21186-4 0 7861
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2 20439 98.5994 214.7636 0010995 314.3356 45.6923 14.29894655223898
DO-17
1 20440U 90005E 94131.78158643 .00000038 00000-0 31885-4 0 7868
2 20440 98.5998 218.5557 0010905 302.2194 57.7929 14.30034790224412
WO-18
1 20441U 90005F 94130.21693527 .00000032 00000-0 29330-4 0 7889
2 20441 98.6000 217.0145 0011444 307.1754 52.8393 14.30009020224194
LO-19
1 20442U 90005G 94129.77786521 .00000032 00000-0 29460-4 0 7857
2 20442 98.5980 216.8261 0011803 308.0215 51.9900 14.30104622224141
UO-22
1 21575U 91050B 94130.18555526 .00000044 00000-0 29276-4 0 4891
2 21575 98.4367 205.4461 0008631 47.4109 312.7787 14.36912298147624
KO-23
1 22077U 92052B 94130.06403504 -.00000037 00000-0 10000-3 0 3848
2 22077 66.0874 359.8032 0013522 299.1158 60.8506 12.86285570 81883
AO-27
1 22825U 93061C 94130.24943309 .00000025 00000-0 27856-4 0 2834
2 22825 98.6559 206.4353 0008740 326.4316 33.6296 14.27621773 32273
IO-26
1 22826U 93061D 94129.74262760 .00000014 00000-0 23562-4 0 2831
2 22826 98.6558 205.9657 0009156 329.5650 30.5000 14.27724911 32201
KO-25
1 22830U 93061H 94129.90200328 -.00000051 00000-0 -31490-5 0 2884
2 22830 98.5572 203.7809 0010466 291.7365 68.2605 14.28050062 32237
NOAA-9
1 15427U 84123A 94128.03936387 .00000067 00000-0 60047-4 0 8094
2 15427 99.0568 178.0512 0014980 337.0876 22.9626 14.13612360484671
NOAA-10
1 16969U 86073A 94125.88441476 .00000029 00000-0 30372-4 0 7075
2 16969 98.5081 136.1764 0014034 90.8018 269.4770 14.24882212396580
MET-2/17
1 18820U 88005A 94129.86989783 .00000056 00000-0 36966-4 0 2856
2 18820 82.5388 299.0667 0015532 292.3795 67.5722 13.84714788317053
MET-3/2
1 19336U 88064A 94130.10094705 .00000051 00000-0 10000-3 0 2826
2 19336 82.5422 350.6395 0017952 2.3151 357.8054 13.16967136278242
NOAA-11
1 19531U 88089A 94128.98316958 .00000115 00000-0 86623-4 0 6279
2 19531 99.1712 116.9385 0010774 244.3291 115.6768 14.12982863289688
MET-2/18
1 19851U 89018A 94128.61495168 .00000039 00000-0 21682-4 0 2835
2 19851 82.5207 175.4687 0014032 345.4777 14.5979 13.84363928262210
MET-3/3
1 20305U 89086A 94132.18115516 .00000044 00000-0 10000-3 0 418
2 20305 82.5507 294.8736 0008418 29.4369 330.7138 13.04416136218209
MET-2/19
1 20670U 90057A 94130.28204066 .00000024 00000-0 79036-5 0 7861
2 20670 82.5442 238.5653 0014273 254.5376 105.4195 13.84188298195375
FY-1/2
```

```
1 20788U 90081A 94131.48858561 .00000310 00000-0 23360-3 0 9627
2 20788 98.8363 152.7904 0016367 108.3552 251.9393 14.01329946188568
MET-2/20
1 20826U 90086A 94128.53528912 .00000054 00000-0 35061-4 0 7941
2 20826 82.5254 177.5273 0014067 152.4733 207.7173 13.83580427182279
MET-3/4
1 21232U 91030A 94129.56143810 .00000050 00000-0 10000-3 0 6925
2 21232 82.5433 196.8958 0011950 287.1445 72.8364 13.16461966146273
NOAA-12
1 21263U 91032A 94129.08330723 .00000166 00000-0 93676-4 0 337
2 21263 98.6209 157.7171 0013201 354.9703 5.1342 14.22401393154977
MET-3/5
1 21655U 91056A 94129.53530609 .00000051 00000-0 10000-3 0 7017
2 21655 82.5504 144.0423 0011555 303.1968 56.8052 13.16829666131379
MET-2/21
1 22782U 93055A 94128.35976126 .00000052 00000-0 34592-4 0 2948
2 22782 82.5472 237.9869 0022594 341.8215 18.2132 13.83005246 34580
POSAT
1 22829U 93061G 94128.71536653 .00000027 00000-0 28744-4 0 2768
2 22829 98.6520 204.9673 0009569 317.8501 42.1930 14.28022544 32062
MIR
1 16609U 86017A 94131.09083626 .00003958 00000-0 56295-4 0 5921
2 16609 51.6479 11.9597 0014199 242.6758 117.2790 15.58953465470263
HUBBLE
1 20580U 90037B 94132.19674090 .00000550 00000-0 39722-4 0 4788
2 20580 28.4681 107.1507 0006308 73.5349 286.5928 14.90597492 24012
GRO
1 21225U 91027B 94128.76775695 .00002590 00000-0 55267-4 0 904
2 21225 28.4612 145.7505 0004131 127.4927 232.6036 15.40755304 50859
UARS
1 21701U 91063B 94129.90242006 .00002997 00000-0 28246-3 0 5165
2 21701 56.9885 312.4941 0005325 97.2687 262.8951 14.96511937145203
/EX
```

717. 80ns EPROM - 27C512 and Trakbox

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 16:03:33 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.120.768845013@UPEI.CA>
Source record: 27465

Has anyone been successful in finding 80 ns access 27C512 EPROMS for the trakbox upgrade? Canadian companies do not currently carry this item in stock - nor are they willing to part with just 1 - 3 units :-)

The name and phone number (non 800 #s pls) or location of American suppliers would be greatly appreciated!

Thanks in advance DAve Seeler, VY2DCS
Internet: Seeler@upei.ca

ps - a manufacturer is Advanced Microdevices (AM27C512-75 DC) for example.

718. Re: Is there a Pacsat/Internet Gateway??

Newsgroup: rec.radio.amateur.space
Date: 1994-05-13 20:48:19 UTC
From: lent@godzilla.mcs.anl.gov
Message-ID: <7688620995464@godzilla.mcs.anl.gov>
Source record: 27470

I know that there are several packet nodes that pass messages between
the packet network and the internet. So if one can pass messages between
the satilite network and the packet network, what do we need to do to make
the next hop into the internet?

how about:
internet through packet gateway to satilite gateway and vice versa?

I am not very versed in all the technicalities of this, but why wouldn't
this work? Is it just that it hasn't been done?
Can anyone provide an FAQ about how to pass messages between
packet <-> satilite?
I have seen lists of internet <-> packet gateways on the radio ftp sites.

73
kc4zqg

719. Please Help Me

Newsgroup: rec.radio.amateur.space
Date: 1994-05-14 02:09:00 UTC
From: pst@techtol.muug.mb.ca
Message-ID: <2dd424ac@techtol.muug.mb.ca>
Source record: 27471

TO: All

From: pst@techtol.muug.mb.ca
->* In a message to All <09 May 94 14:16> Michael Malloy wrote:*

MM> From: mmjjmm@post.its.mcw.edu (Michael Malloy)

MM> I am interested in getting started in
MM> satellite communications and would
MM> like to get more information. If you
MM> have any files or information that
MM> you could forward I would be greatful.
MM> 73 Mike N9WJV

Hi Mike, Just for starters ... what type of equipment do you have on hand
right now?

Bye for now. Paul J.

... -*->E-Mail by Internet to -> pst@techtol.muug.mb.ca (Paul Strelioff)
___ CRR QWK 1.60+

720. sat contacts with Antarctica

Newsgroup: rec.radio.amateur.space
Date: 1994-05-14 06:10:10 UTC
From: brent@network.ucsd.edu
Message-ID: <2r1q02$adv@network.ucsd.edu>
Source record: 27474

Hello,

I have been playing around on RS-10 and Eyesat-1 over the past couple of weeks with no problem getting into either bird. Unfortunately, it's getting pretty boring talking to myself...

Does anyone live in or know anyone in New Zealand or southern South America who would be interested in attempting a satellite contact with KC4AAA? This has never been done before at this station, at least on the ham satellites. I'm in the process of putting together a station for some of the other satellites to try to make contact with the states, but right now can only come up on RS-10 and Eyesat-1. Co-visibility to NZ on RS-10 is brief, but contact would be possible.

Brent Jones
KB1UK/KC4AAA

721. Two-Line Orbital Element Sets (TLE394)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-14 14:06:24 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.768924384@afit.af.mil>
Source record: 27475

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

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- Current Two-Line Element Sets #394 -
Alouette 1
1 00424U 62049 94133.01649331 .00000082 00000-0 86775-4 0 9906
2 00424 80.4634 319.7067 0022521 203.7629 156.2475 13.67809287577595
ATS 1
1 02608U 66110A 94128.96241248 -.00000236 00000-0 10000-3 0 8681
2 02608 14.5413 0.8185 0010221 37.3836 87.8175 1.00389538 17072
ATS 3
1 03029U 67111A 94130.35245397 -.00000113 00000-0 10000-3 0 1874
2 03029 14.6192 7.8637 0010140 269.3230 332.3134 1.00272966 97054
Cosmos 398
1 04966U 71016A 94133.14101877 .00073065 63704-5 15141-3 0 1970
2 04966 51.4555 106.9857 1053344 260.5564 87.4701 13.81821033767890
Starlette
1 07646U 75010A 94133.01260005 -.00000133 00000-0 60118-5 0 7773
2 07646 49.8271 292.1546 0206292 220.0300 138.5235 13.82186103972988
LAGEOS
1 08820U 76039A 94129.42738958 .00000014 00000-0 10000-3 0 9892
2 08820 109.8247 122.3264 0044329 293.5285 66.0589 6.38664212164673
ETS-2
1 09852U 77014A 94130.00000000 .00000112 00000-0 10000-3 0 9628
2 09852 12.0881 41.9435 0001849 28.7738 185.2316 1.00010025 9946
GOES 2
1 10061U 77048A 94130.58089742 .00000075 00000-0 00000+0 0 3247
2 10061 11.1270 46.1469 0001690 338.6025 277.8299 1.00254940 6730
IUE
1 10637U 78012A 94133.24474729 -.00000198 00000-0 10000-3 0 9964
2 10637 34.5628 95.4335 1313199 34.8115 139.6938 1.00278487 12374
GPS BI-01
1 10684U 78020A 94128.85535808 -.00000068 00000-0 10000-3 0 2646
2 10684 64.6234 46.6748 0062636 163.5269 196.6827 1.98070534104153
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GPS BI-02
1 10893U 78047A 94124.60864295 -.00000034 00000-0 10000-3 0 631
2 10893 63.5677 285.8314 0214154 13.8993 346.6492 2.01627338117193
GOES 3
1 10953U 78062A 94129.57716094 .00000075 00000-0 10000-3 0 2983
2 10953 10.0685 48.9433 0003639 84.6286 127.2505 1.00273088 11335
SeaSat 1
1 10967U 78064A 94129.78812583 .00000009 00000-0 47745-4 0 2842
2 10967 108.0020 22.7634 0001900 278.2398 81.8527 14.37952020830846
GPS BI-03
1 11054U 78093A 94127.42149029 -.00000055 00000-0 10000-3 0 1775
2 11054 63.2588 282.9531 0043786 175.7363 184.2695 1.93505198113725
Nimbus 7
1 11080U 78098A 94128.10875622 -.00000064 00000-0 -19624-4 0 3887
2 11080 99.0608 13.2288 0008247 239.6795 120.3547 13.83734043784535
GPS BI-04
1 11141U 78112A 94131.03501274 -.00000049 00000-0 00000+0 0 8797
2 11141 64.6271 47.7840 0048481 25.1348 335.1105 1.92894897 3068
GPS BI-05
1 11690U 80011A 94132.01172940 -.00000038 00000-0 10000-3 0 7804
2 11690 64.9607 48.3842 0141649 197.3462 162.1808 2.00555376118815
GPS BI-06
1 11783U 80032A 94132.60782710 -.00000025 00000-0 10000-3 0 9670
2 11783 62.6729 279.4117 0210011 29.2115 331.9263 2.03457414103236
GOES 5
1 12472U 81049A 94131.44237791 .00000085 00000-0 10000-3 0 7639
2 12472 6.7514 58.4664 0005672 355.0000 198.5783 1.00307145 5396
Cosmos 1383
1 13301U 82066A 94132.99818127 .00000062 00000-0 54956-4 0 2886
2 13301 82.9282 335.5592 0022663 191.0329 169.0333 13.68055146592614
LandSat 4
1 13367U 82072A 94130.77479040 .00000032 00000-0 17162-4 0 4838
2 13367 98.1810 189.9833 0007610 18.4351 341.7119 14.57120276628610
IRAS
1 13777U 83004A 94133.01907203 -.00000054 00000-0 -71463-5 0 5917
2 13777 98.9740 324.7080 0013396 55.5815 304.6619 13.99196224246220
Cosmos 1447
1 13916U 83021A 94129.82683489 .00000035 00000-0 20552-4 0 3885
2 13916 82.9440 40.0683 0038559 133.7748 226.6609 13.74308652558067
TDRS 1
1 13969U 83026B 94121.61741505 -.00000211 00000-0 10000-4 0 2963
2 13969 7.6148 51.6051 0004535 64.6502 50.6929 1.00271279 13581
GOES 6
1 14050U 83041A 94129.33511230 -.00000075 00000-0 10000-3 0 1987
2 14050 5.5434 61.4610 0005229 329.6428 209.8735 1.00216929 12392
OSCAR 10
1 14129U 83058B 94130.80459721 -.00000016 00000-0 10000-3 0 2775
2 14129 27.1382 328.2037 6020986 177.1779 188.9849 2.05880044 54048
LandSat 5
1 14780U 84021A 94128.75263664 .00000076 00000-0 26855-4 0 644
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2 14780 98.1658 189.2931 0005626 32.4220 327.7319 14.57134203541736
UoSat 2
1 14781U 84021B 94129.54582830 .00000211 00000-0 43582-4 0 6870
2 14781 97.7882 146.0792 0012814 37.7565 322.4528 14.69203696544636
GPS BI-09
1 15039U 84059A 94125.85340535 -.00000084 00000-0 10000-4 0 1965
2 15039 63.8874 42.3614 0055786 215.8534 143.7749 2.00558536 72496
Cosmos 1574
1 15055U 84062A 94129.90241121 .00000033 00000-0 19519-4 0 5879
2 15055 82.9537 93.2844 0027369 326.9124 33.0314 13.73605091495373
GPS BI-10
1 15271U 84097A 94126.76619192 -.00000055 00000-0 10000-3 0 7967
2 15271 62.3735 279.6472 0145355 348.9974 10.6543 2.00580510 69777
Cosmos 1602
1 15331U 84105A 94129.88427413 .00000512 00000-0 57871-4 0 2794
2 15331 82.5315 113.5914 0020263 335.8513 24.1750 14.84391265518831
NOAA 9
1 15427U 84123A 94128.03936387 .00000067 00000-0 60047-4 0 8094
2 15427 99.0568 178.0512 0014980 337.0876 22.9626 14.13612360484671
GPS BI-11
1 16129U 85093A 94105.19791667 -.00000022 00000-0 10000-3 0 5826
2 16129 64.7044 45.1922 0140135 148.8942 294.6332 1.93432400 8888
Mir
1 16609U 86017A 94133.01390049 .00005352 00000-0 73721-4 0 5939
2 16609 51.6479 2.3028 0014201 250.1408 109.8055 15.58980035470563
SPOT 1
1 16613U 86019A 94131.21976427 .00000089 00000-0 62356-4 0 6773
2 16613 98.6921 205.5080 0001814 14.0457 346.0769 14.20053926111313
Cosmos 1766
1 16881U 86055A 94127.55252822 .00000350 00000-0 39632-4 0 1944
2 16881 82.5208 173.7970 0020179 7.0683 353.0816 14.83421315419437
EGP
1 16908U 86061A 94129.68787084 -.00000097 00000-0 00000+0 0 8847
2 16908 50.0093 202.7623 0011774 212.9298 147.0804 12.44409682 20598
NOAA 10
1 16969U 86073A 94125.88441476 .00000029 00000-0 30372-4 0 7075
2 16969 98.5081 136.1764 0014034 90.8018 269.4770 14.24882212396580
MOS-1
1 17527U 87018A 94128.82034602 .00000091 00000-0 99794-4 0 673
2 17527 99.0352 198.3330 0001750 24.9057 335.2187 13.94905164367455
GOES 7
1 17561U 87022A 94128.45731596 -.00000047 00000-0 10000-3 0 8381
2 17561 1.4699 76.2285 0004692 345.8121 216.5810 1.00276436 9579
Kvant-1
1 17845U 87030A 94133.07801900 .00012751 00000-0 16629-3 0 8451
2 17845 51.6485 1.9859 0014504 251.4865 108.5553 15.58989060470642
DMSP B5D2-3
1 18123U 87053A 94125.87800314 .00000020 00000-0 32686-4 0 4828
2 18123 98.7888 318.2085 0013757 305.1528 54.8362 14.15353289355023
RS-10/11
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1 18129U 87054A 94130.08415553 -.00000000 00000-0 -16999-4 0 8969
2 18129 82.9265 357.0128 0012666 123.6132 236.6238 13.72335938344689
Meteor 2-16
1 18312U 87068A 94127.81833693 .00000061 00000-0 41247-4 0 2844
2 18312 82.5534 243.8648 0010962 222.9642 137.0664 13.84028819339471
Meteor 2-17
1 18820U 88005A 94129.86989783 .00000056 00000-0 36966-4 0 2856
2 18820 82.5388 299.0667 0015532 292.3795 67.5722 13.84714788317053
DMSP B5D2-4
1 18822U 88006A 94125.80243440 .00000048 00000-0 39974-4 0 5847
2 18822 98.4473 342.5180 0007211 101.3511 258.8479 14.22947113324493
Glonass 34
1 19163U 88043A 94127.12508055 .00000062 00000-0 10000-3 0 8858
2 19163 65.0220 111.8233 0007343 167.8715 192.1412 2.13102353 45782
Glonass 36
1 19165U 88043C 94128.11942294 .00000053 00000-0 10000-3 0 2783
2 19165 65.0050 111.7461 0004160 322.4986 37.4652 2.13102208 46428
METEOSAT 3
1 19215U 88051A 94129.61157040 -.00000253 00000-0 10000-3 0 8993
2 19215 1.6526 72.6716 0000489 351.8945 308.2856 1.00280837 9522
AO-13
1 19216U 88051B 94126.28995779 -.00000321 00000-0 10000-4 0 9092
2 19216 57.8344 254.1456 7210927 340.7734 2.0051 2.09721388 13636
OKEAN 1
1 19274U 88056A 94130.80379290 .00000339 00000-0 39486-4 0 8959
2 19274 82.5108 270.6276 0020827 128.4924 231.8167 14.82162731315549
Meteor 3-2
1 19336U 88064A 94130.10094705 .00000051 00000-0 10000-3 0 2826
2 19336 82.5422 350.6395 0017952 2.3151 357.8054 13.16967136278242
Glonass 39
1 19503U 88085C 94128.61447521 -.00000045 00000-0 10000-3 0 1784
2 19503 65.7282 350.6733 0007678 172.6574 187.4283 2.13102880 43923
NOAA 11
1 19531U 88089A 94125.86746860 .00000092 00000-0 74632-4 0 6262
2 19531 99.1703 113.7463 0010794 253.4829 106.5157 14.12981639289243
TDRS 2
1 19548U 88091B 94130.50578894 -.00000281 00000-0 10000-3 0 9150
2 19548 0.9333 77.7916 0001957 336.3550 294.0533 1.00280982 7824
Glonass 40
1 19749U 89001A 94130.06162703 .00000042 00000-0 10000-3 0 3882
2 19749 64.9654 111.2985 0007013 261.2616 98.6415 2.13101384 41469
Glonass 41
1 19750U 89001B 94130.11813901 .00000042 00000-0 10000-3 0 2815
2 19750 64.9853 111.3619 0005072 251.3106 108.5749 2.13101827 41489
GPS BII-01
1 19802U 89013A 94127.33892284 .00000080 00000-0 10000-3 0 8983
2 19802 55.1090 141.3289 0031986 179.4960 180.5637 2.00548111 38231
Akebono
1 19822U 89016A 94129.23322677 .00010659 00000-0 55254-3 0 2575
2 19822 75.1101 204.5184 3824279 319.4508 17.5894 7.77722116106267
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Meteor 2-18
1 19851U 89018A 94133.02378206 .00000061 00000-0 41858-4 0 2842
2 19851 82.5206 171.9545 0014011 333.0989 26.9445 13.84364458262829
MOP-1
1 19876U 89020B 94125.44136900 -.00000082 00000-0 00000+0 0 247
2 19876 0.3683 61.6465 0001098 15.4286 296.4680 1.00273917 6646
TDRS 3
1 19883U 89021B 94130.68109375 -.00000262 00000-0 00000+0 0 9131
2 19883 0.0774 82.5043 0000672 280.4879 69.5021 1.00271179 89091
GPS BII-02
1 20061U 89044A 94132.67178087 -.00000060 00000-0 10000-3 0 9202
2 20061 54.6765 317.8990 0127975 207.8945 151.4145 2.00565503 36081
Nadezhda 1
1 20103U 89050A 94130.50141833 .00000047 00000-0 33927-4 0 9876
2 20103 82.9578 315.5538 0039308 35.1506 325.2224 13.73838083243137
GPS BII-03
1 20185U 89064A 94131.01319495 .00000064 00000-0 00000+0 0 9082
2 20185 54.9270 141.8220 0010186 266.2352 93.7003 2.00574224 34628
GMS 4
1 20217U 89070A 94130.71934071 -.00000279 00000-0 10000-3 0 67
2 20217 0.1856 65.6973 0001093 42.5817 159.1941 1.00267774 17710
GPS BII-04
1 20302U 89085A 94130.54793700 -.00000046 00000-0 00000+0 0 9179
2 20302 53.5900 258.3058 0001825 263.4103 96.5657 2.00564440 33411
Meteor 3-3
1 20305U 89086A 94133.25500049 .00000044 00000-0 10000-3 0 427
2 20305 82.5491 294.1284 0007981 24.8674 335.2779 13.04414501218344
COBE
1 20322U 89089A 94130.06255454 -.00000133 00000-0 -57013-4 0 25
2 20322 98.9774 146.7043 0009063 22.7355 337.4215 14.03430917229046
Kvant-2
1 20335U 89093A 94133.07801900 .00012751 00000-0 16629-3 0 9158
2 20335 51.6485 1.9859 0014504 251.4865 108.5553 15.58989060470561
GPS BII-05
1 20361U 89097A 94129.06031379 -.00000024 00000-0 10000-3 0 7932
2 20361 55.5084 83.8404 0070959 108.1265 252.6120 2.00559783 22866
SPOT 2
1 20436U 90005A 94131.33029749 .00000095 00000-0 65161-4 0 7854
2 20436 98.7184 206.3115 0001154 40.8859 319.2403 14.20029274222860
UO-14
1 20437U 90005B 94130.22723062 .00000037 00000-0 31238-4 0 9879
2 20437 98.5905 215.5169 0010604 307.4689 52.5521 14.29841089224162
UO-15
1 20438U 90005C 94130.21575465 .00000003 00000-0 18557-4 0 7871
2 20438 98.5894 214.5223 0009759 311.5173 48.5178 14.29174349224085
PACSAT
1 20439U 90005D 94132.73338135 .00000023 00000-0 25875-4 0 7875
2 20439 98.5990 219.1851 0010892 301.2386 58.7720 14.29895379224532
DO-17
1 20440U 90005E 94127.72342758 .00000035 00000-0 30616-4 0 7856
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2 20440 98.5998 214.5469 0011036 314.4970 45.5303 14.30034132223839
WO-18
1 20441U 90005F 94130.21693527 .00000032 00000-0 29330-4 0 7889
2 20441 98.6000 217.0145 0011444 307.1754 52.8393 14.30009020224194
LO-19
1 20442U 90005G 94129.77786521 .00000032 00000-0 29460-4 0 7857
2 20442 98.5980 216.8261 0011803 308.0215 51.9900 14.30104622224141
GPS BII-06
1 20452U 90008A 94128.46138354 .00000024 00000-0 10000-3 0 8997
2 20452 54.0573 198.1339 0052666 74.8023 285.9002 2.00574117 31357
MOS-1B
1 20478U 90013A 94128.72206788 .00000091 00000-0 10000-3 0 6191
2 20478 99.0353 202.3660 0001469 87.1204 273.0126 13.94904999137147
DEBUT
1 20479U 90013B 94127.46291971 .00000002 00000-0 68801-4 0 7826
2 20479 99.0316 287.0960 0541185 71.4736 294.4368 12.83318882198914
FO-20
1 20480U 90013C 94129.46561045 -.00000008 00000-0 46937-4 0 6824
2 20480 99.0315 288.6150 0541341 67.1736 298.5600 12.83225679199162
MOS-1B R/B
1 20491U 90013D 94130.05706399 -.00000525 00000-0 -91815-3 0 9985
2 20491 99.0265 333.1540 0469940 297.1633 58.2302 13.02983920201696
LACE
1 20496U 90015A 94132.93339111 .00002114 00000-0 73657-4 0 3999
2 20496 43.1018 249.1290 0009919 141.3513 218.8054 15.32950334236119
Nadezhda 2
1 20508U 90017A 94129.84945744 .00000049 00000-0 36486-4 0 9884
2 20508 82.9510 90.6899 0044860 349.4086 10.6121 13.73474797210285
OKEAN 2
1 20510U 90018A 94130.21172456 .00000311 00000-0 39623-4 0 2963
2 20510 82.5239 220.1084 0018299 319.7501 40.2357 14.78322019226054
INTELSAT-6
1 20523U 90021A 94132.49520166 -.00000237 00000-0 10000-3 0 4101
2 20523 0.0086 349.9013 0000139 261.3112 122.5416 1.00267920 8259
GPS BII-07
1 20533U 90025A 94130.36602333 -.00000067 00000-0 10000-3 0 9002
2 20533 55.0170 318.4877 0044802 81.5966 278.9271 2.00572400 30160
PegSat
1 20546U 90028A 94129.86871963 .00007880 00000-0 18714-3 0 6263
2 20546 94.1180 276.3783 0077472 82.1319 278.8688 15.38581853226373
HST
1 20580U 90037B 94128.91585729 .00000569 00000-0 41561-4 0 4776
2 20580 28.4680 128.2325 0006208 40.2625 319.8420 14.90594921 23526
MACSAT 2
1 20608U 90043B 94127.62133209 .00000217 00000-0 35090-4 0 9857
2 20608 89.9281 179.9729 0103523 232.9738 126.1984 14.64699946213349
Glonass 44
1 20619U 90045A 94132.77742953 -.00000040 00000-0 00000+0 0 657
2 20619 65.3492 350.1489 0022799 210.5113 149.4323 2.13103044 30974
Glonass 45
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1 20620U 90045B 94128.20345372 -.00000047 00000-0 00000+0 0 642
2 20620 65.3338 350.2990 0009153 41.0720 319.0536 2.13102617 30913
Glonass 46
1 20621U 90045C 94127.79887816 -.00000049 00000-0 10000-3 0 6979
2 20621 65.3505 350.3486 0013101 195.4502 164.5746 2.13101412 30908
Kristall
1 20635U 90048A 94130.83444387 -.00002874 00000-0 -29537-4 0 7075
2 20635 51.6476 13.2498 0014142 241.9600 118.0945 15.58943447470186
ROSAT
1 20638U 90049A 94128.14456045 .00000272 00000-0 37051-4 0 2921
2 20638 52.9891 169.9174 0010599 307.5149 52.4904 15.06805609216042
Meteor 2-19
1 20670U 90057A 94130.28204066 .00000024 00000-0 79036-5 0 7861
2 20670 82.5442 238.5653 0014273 254.5376 105.4195 13.84188298195375
CRRES
1 20712U 90065A 94128.47311936 .00000200 00000-0 43171-3 0 9003
2 20712 17.6932 204.0756 7178730 159.5821 258.6688 2.35143933 24956
GPS BII-08
1 20724U 90068A 94132.18255175 .00000060 00000-0 10000-3 0 7898
2 20724 54.7414 139.4380 0109186 161.5088 198.9186 2.00561814 27620
Feng Yun1-2
1 20788U 90081A 94133.05938839 .00000340 00000-0 25377-3 0 9633
2 20788 98.8362 154.3110 0016396 104.3580 255.9405 14.01331393188784
Meteor 2-20
1 20826U 90086A 94132.58504276 .00000049 00000-0 31273-4 0 7954
2 20826 82.5258 174.3059 0014158 141.2539 218.9638 13.83580685182839
GPS BII-09
1 20830U 90088A 94127.25118259 -.00000023 00000-0 10000-3 0 7914
2 20830 55.4454 81.9491 0065847 105.1273 255.5698 2.00560618 26605
GPS BIIA-10
1 20959U 90103A 94131.13955504 .00000063 00000-0 10000-3 0 7001
2 20959 54.9578 141.3815 0084431 225.7765 133.5640 2.00566431 25277
DMSP B5D2-5
1 20978U 90105A 94127.37133117 .00000135 00000-0 64702-4 0 7114
2 20978 98.6891 190.8369 0078497 285.1359 74.1155 14.32412787179260
Glonass 47
1 21006U 90110A 94129.23610775 .00000044 00000-0 00000+0 0 6530
2 21006 64.9441 110.6947 0059405 188.5836 171.3004 2.13102702 26607
Glonass 48
1 21007U 90110B 94131.29877069 .00000041 00000-0 00000+0 0 7607
2 21007 64.9623 110.6895 0035714 183.1922 176.7971 2.13101188 26649
Glonass 49
1 21008U 90110C 94130.24738413 .00000041 00000-0 00000+0 0 7612
2 21008 64.9451 110.6799 0011194 281.8635 77.9913 2.13099536 26602
AO-21
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2 21087 82.9448 171.5920 0034734 189.9860 170.0610 13.74538981164221
RS-12/13
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2 21089 82.9238 37.3882 0028156 203.8370 156.1477 13.74040087163847
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2 21140 0.2601 18.7776 0002546 56.5219 170.4257 1.00281523 884
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GRO
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2 21263 98.6206 156.6847 0013214 358.0055 2.1068 14.22400932154825
OKEAN 3
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2 21397 82.5245 132.3702 0024107 29.3384 330.9180 14.76199721157836
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ERS-1
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ORBCOMM-X
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2 21578 98.4480 207.5567 0006089 60.3974 299.7728 14.38758823147692
TDRS 4
1 21639U 91054B 94125.34268211 .00000073 00000-0 10000-3 0 7215
2 21639 0.0770 52.7437 0002906 61.6762 57.6510 1.00277436 8147
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2 21798 98.9641 131.4537 0011800 260.5448 99.4388 14.13792830125613
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2 21853 64.9001 110.3663 0008441 192.0756 167.8733 2.13102387 17749
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2 21854 64.8948 110.2836 0016825 8.1179 351.8843 2.13103684 17772
Glonass 55
1 21855U 92005C 94129.06152001 .00000044 00000-0 00000+0 0 9590
2 21855 64.8928 110.4084 0007528 220.4069 139.5158 2.13102209 17687
JERS-1
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EUVE
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2 21987 28.4346 299.6527 0009787 293.1243 66.8302 15.18497348106823
SAMPEX
1 22012U 92038A 94127.28488157 .00001297 00000-0 11222-3 0 5126
2 22012 81.6725 214.0090 0119426 172.2119 188.0987 14.90979709100186
GPS BIIA-14
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2 22014 54.9014 199.2921 0059853 309.3768 50.1538 2.00564538 6969
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2 22056 64.9247 350.2007 0004065 285.8861 74.1260 2.13103107 13810
Glonass 57
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2 22058 64.9319 350.1348 0008657 288.2192 71.7402 2.13103333 13883
TOPEX
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KO-23
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2 22077 66.0874 359.8032 0013522 299.1158 60.8506 12.86285570 81883
S80/T
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2 22108 54.3444 259.1808 0118073 132.8252 228.1368 2.00553270 12091
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1 22161U 92064A 94131.14970403 .00000057 00000-0 74143-4 0 3965
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GPS BIIA-17
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TDRS 5
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2 22314 1.0279 72.6198 0002788 326.6917 240.6343 1.00263244 4979
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1 22512U 93010A 94132.93234551 .00000049 00000-0 00000+0 0 5679
2 22512 64.9041 110.1436 0009223 212.3338 147.5913 2.13102003 9362
Glonass 60
1 22513U 93010B 94130.99558092 .00000040 00000-0 00000+0 0 5775
2 22513 64.8969 110.2101 0006926 212.5863 147.3507 2.13102780 9519
Glonass 61
1 22514U 93010C 94132.17005808 .00000044 00000-0 00000+0 0 5628
2 22514 64.9152 110.1576 0013186 200.6631 159.2613 2.13101767 9544
ASTRO-D
1 22521U 93011A 94132.99807151 .00001140 00000-0 93480-4 0 2868
2 22521 31.1032 296.9616 0075877 108.9096 251.9784 14.93180812 66836
UFO F1
1 22563U 93015A 94120.62194181 -.00000020 00000-0 10000-3 0 2781
2 22563 26.7316 300.4763 0003510 7.0015 216.4137 0.99247373 8365
GPS BIIA-19
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2 22581 55.0969 19.0522 0047793 33.9564 326.3863 2.00568884 8227
ARSENE
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2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202361 582
GPS BIIA-20
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2 22657 55.1175 18.9143 0058037 206.4135 153.3204 2.00558617 3520
RADCAL
1 22698U 93041A 94129.47491686 .00000063 00000-0 22637-4 0 2901
2 22698 89.5459 311.3929 0090782 315.0577 44.3275 14.21308888 45097
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NOAA 13
1 22739U 93050A 94130.56010787 -.00000183 00000-0 -77094-4 0 4339
2 22739 98.9424 75.1027 0009061 225.6856 134.3594 14.10893165 38652
GPS BIIA-22
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2 22779 54.8204 318.8311 0022581 227.0018 132.8180 2.00570127 5052
Meteor 2-21
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2 22782 82.5480 234.4911 0022126 329.5225 30.4648 13.83005585 35196
UFO F2
1 22787U 93056A 94119.74573311 -.00000094 00000-0 10000-3 0 2737
2 22787 4.8760 323.3924 0006135 354.2731 240.5443 1.00274427 761
SPOT 3
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2 22823 98.7125 207.2391 0001090 74.9053 285.2227 14.20034841 32384
STELLA
1 22824U 93061B 94131.24122230 -.00000062 00000-0 -74219-5 0 2835
2 22824 98.6563 207.3242 0006115 325.3072 34.7712 14.27096147 32406
AO-27
1 22825U 93061C 94130.24943309 .00000025 00000-0 27856-4 0 2834
2 22825 98.6559 206.4353 0008740 326.4316 33.6296 14.27621773 32273
IO-26
1 22826U 93061D 94129.74262760 .00000014 00000-0 23562-4 0 2831
2 22826 98.6558 205.9657 0009156 329.5650 30.5000 14.27724911 32201
HEATHSAT
1 22827U 93061E 94133.15992482 .00000044 00000-0 35671-4 0 3460
2 22827 98.6538 209.3230 0008821 305.7656 54.2723 14.27834950 32698
PO-28
1 22829U 93061G 94133.19963416 .00000044 00000-0 35350-4 0 2778
2 22829 98.6517 209.4085 0009569 304.5811 55.4472 14.28023395 32706
KO-25
1 22830U 93061H 94129.90200328 -.00000051 00000-0 -31490-5 0 2884
2 22830 98.5572 203.7809 0010466 291.7365 68.2605 14.28050062 32237
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2 22877 55.2050 79.9801 0034368 286.1057 73.4728 2.00579921 3966
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1 22912U 93073B 94125.33975491 -.00000096 00000-0 00000+0 0 783
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Soyuz TM-18
1 22957U 94001A 94130.83444387 -.00002874 00000-0 -29537-4 0 1138
2 22957 51.6476 13.2498 0014142 241.9600 118.0945 15.58943447 19140
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ODERACS E
1 22994U 94006F 94125.21159322 .00026815 00000-0 15054-3 0 587
2 22994 56.9817 166.0342 0021533 78.4227 281.9154 15.78848607 13323
ODERACS F
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2 22995 56.9834 144.7587 0021642 85.7839 274.5733 15.79161340 14064
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2 22998 56.9884 131.3616 0018213 100.6696 259.6465 15.78464805 14398
GPS BIIA-24
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2 23027 54.9418 21.1608 0062069 190.4796 169.4145 2.00556549 1214
SEDS 2
1 23028U 94016B 94128.53971118 .13369896 -21752-5 25228-3 0 906
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1 23035U 94019A 94130.83444387 -.00002874 00000-0 -29537-4 0 561
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GOES 8
1 23051U 94022A 94128.57905801 -.00000180 00000-0 00000+0 0 919
2 23051 0.4396 268.5389 0035572 43.0730 31.6180 1.00302054 21
Cosmos 2278
1 23087U 94023A 94133.02176812 .00000161 00000-0 11363-3 0 126
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2 23088 71.0050 344.0424 0004932 286.1239 73.9334 14.13778012 2326
1994023C
1 23089U 94023C 94127.62274396 .00000060 00000-0 96918-4 0 110
2 23089 71.0291 350.6745 0200905 76.9326 285.4084 13.71649198 1981
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2 23090 71.0320 340.1835 0193349 44.7907 316.8627 13.73118704 2733
1994023E
1 23091U 94023E 94129.59758790 -.00000023 00000-0 17683-4 0 62
2 23091 70.9850 346.2630 0201756 73.5982 288.7254 13.71151036 2258
Cosmos 2279
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1 23092U 94024A 94124.37511774 .00000024 00000-0 10000-4 0 93
2 23092 82.9436 269.3939 0033900 265.2608 94.2889 13.74972711 1143
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1 23093U 94024B 94131.34511185 -.00001143 00000-0 -11843-2 0 207
2 23093 82.9398 264.2106 0026657 237.9342 121.9261 13.76377318470026
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1 23094U 94023F 94130.97795359 -.00001122 00000-0 -10329-2 0 128
2 23094 70.9850 343.5941 0204071 44.8646 316.8809 13.71592857 2447
Cosmos 2280
1 23095U 94025A 94133.06989759 .00120022 99109-5 17259-3 0 282
2 23095 70.3776 116.5917 0041356 83.3694 277.2218 16.03530368 2302
SROSS C2
1 23099U 94027A 94132.97273181 .00001623 00000-0 14300-3 0 244
2 23099 46.0454 92.8095 0344444 218.1366 139.4589 14.65263573 1317
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1 23100U 94027B 94129.90625500 .00001093 00000-0 10464-3 0 71
2 23100 46.0388 107.7697 0345615 203.1493 155.3486 14.64696941 901
1994028A
1 23101U 94028A 94133.22074519 -.00004369 00000-0 -75083-4 0 127
2 23101 97.0581 328.0640 0020424 209.0247 150.9978 15.50284543 644
1994028B
1 23102U 94028B 94131.54310240 .00033797 00000-0 49833-3 0 77
2 23102 96.8415 326.4048 0077340 217.6363 141.9463 15.51810710 387
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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722. Re: 435 MHZ down converters?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-14 23:37:06 UTC
From: wk@frc.maf.govt.nz
Message-ID: <1994May14.233706.6282@frc.maf.govt.nz>
Source record: 27476

The 70 cm -> 10 m down converter is the approach I have taken to get on the microstats. It helps if your HF rig has a general coverage receiver, as you'll need 3 MHz of IF to cover the 70 cm sat band. I have converted 435 MHz to 27 MHz (finally a use for that band :-) and 438 ends up at 30 MHz.

The 408 MHz crystal train is out of a German book (UHF Unterlage), driving an SBL1 diode ring mixer. The ARRL handbook has some good hints on how to terminate the SBL1 properly. Another book worth looking at for down converter design is the VHF/UHF DX handbook, published by the RSGB if I am not wrong, this book has excellent design tips on transverters and RF power amps.

You could move your preamp to the mast head, or even the entire converter. The choice depends on your transmission (rx?) line losses. If losses are high, you should consider putting the entire converter up, to allow you to minimize front end gain and improve intermod performance.

Moderate losses, and you could put up with the less than ideal gain distribution and use a masthead preamp only. In case of a short run of good quality coax, you could decide to trade a little bit of performance for the convenience of having preamp and converter in the shack.

If you are using a beam to track the micro sats, things become much less critical, an omni downlink antenna places much higher demands on noise figure, sensitivity and intermod resistance. Basically, there are no hard and fast rules: 'it depends'.

Using a GP and 15 m of RG58 (all electronics in the shack) I receive the microsats around S5 during good passes. I get them from 20 deg elevation, but as expected fading gets pretty bad when the rise high. Signals aren't really good enough, the TAPR PSK modem has trouble AFC tracking at times. I am working on a Lindenblad which will have a 3SK97 masthead preamp and RG213 coax.

Wilbert ZL2BSJ
--
Wilbert Knol, Acoustics Group, MAF Marine Research, Wellington, New Zealand.
Usenet: wk@frc.maf.govt.nz PACKET:ZL2BSJ@ZL2WA.NZL.OC
AMPR:[44.147.180.88] AX25 NET/ROM TCP/IP MBX 146.625 147.075 MHz 24 hrs.

723. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-05-15 13:45:32 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-769009526@unomaha.edu>
Source record: 27477
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

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Posted-By: auto-faq 3.2.1.2
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info,
and rec.radio.swap newsgroups. It is intended to serve as a guide for the new
reader on what to find where. Questions and comments may be directed to the
author, Jay Maynard, K5ZC, by Internet electronic mail at
jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September
1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to
note the rmgroup of rec.radio.amateur.packet, and to officially retire some
(in)famous threads of discussion on rec.radio.amateur.policy.

History
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Way back when, before there was a Usenet, the Internet hosted a mailing list
for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions
were held on the mailing list, and sent to the mailboxes of those who had
signed up for it. When the Usenet software was created, and net news as we
now know it was developed, a newsgroup was created for hams: net.ham-radio.
The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began
to dominate other topics in the group and on the list. This resulted in the
logical solution: a group was created to hold the packet discussion, and
another corresponding mailing list was created as well: net.ham-radio.packet
and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great
Renaming essentially unchanged, moving from net.ham-radio[.packet] to
rec.ham-radio[.packet]. Readership and volume grew with the rest of the
network.

The INFO-HAMS mailing list was originally run from a US Army computer at
White Sands Missile Range, SIMTEL20. There were few problems with this
arrangement, but one was that the system was not supposed to be used for
commercial purposes. Since one of hams' favorite pastimes is swapping
gear, it was natural for hams to post messages about equipment for sale
to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use
restriction, and after some argument, a group was created specifically
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for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
===========================

Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

--
Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

724. ANS-133 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-05-15 22:48:31 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-133.01.1994@ampr.org>
Source record: 27478
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-133.01
AMSAT-NA SYMPOSIUM REMINDER

HR AMSAT NEWS SERVICE BULLETIN 133.01 FROM AMSAT HQ
SILVER SPRING, MD MAY 14, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-133.01

10th Annual AMSAT-NA Symposium Information

The 10th AMSAT-NA Space Symposium and Annual Board-of-Directors Meeting will be held this year in Orlando, FL on October 7,8, and 9th. The location of the Symposium will be the Holiday Inn near the Orlando International Airport. For further information about the Symposium, please contact Martha Saragovitz at AMSAT-NA Headquarters at (301) 589-6062. Start your planning now so that you can be ready to attend this year's AMSAT-NA Space Symposium.

[The AMSAT News Service (ANS) would like to thank Martha Saragovitz for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-133.02
UNAMSAT-1 LAUNCH DATE SET

HR AMSAT NEWS SERVICE BULLETIN 133.02 FROM AMSAT HQ
SILVER SPRING, MD MAY 14, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-133.02

XE1TU Announces That Launch Date For UNAMSAT-1 Is Set

David Liberman (XE1TU) has spent the past five weeks in bed trying to get rid of a bad case of hepatitis. But he reports that he is well again and back in the lab preparing to begin the launch campaign of UNAMSAT-1 MICROSAT. The launch date has been set for the 15-JUNE-94, but there is a possiblity that it might get delayed about one week. XE1TU and his UNAMSAT-1 team is preparing to leave Mexico City soon to fly to Moscow where UNAMSAT-1 will be put into a thermal vacuum chamber and tested before it is attached to the launch vehicle.

XE1TU would like to thank all those who sent him "get-well" messages and cards and he promises to answer all of them. XE1TU notes that when he returned to work last week, he had over 530 messages waiting for him on e-mail!

Watch for progress reports about the launch campaign of UNAMASAT-1 in the AMSAT News Service (ANS) bulletins.

[The AMSAT News Service (ANS) would like to thank David Liberman (XE1TU) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-133.03
AO-13 OPS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 133.03 FROM AMSAT HQ
SILVER SPRING, MD MAY 14, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-133.03

Current AMSAT Operations Net Schedule For AO-13

AMSAT Operations Nets are planned for the following times. Mode-B Nets are conducted on AO-13 on a downlink frequency of 145.950 MHz. If, at the start of the OPS Net, the frequency of 145.950 MHz is being used for a QSO, OPS Net enthusiasts are asked to move to the alternate frequency of 145.955 MHz.

Date UTC Mode Phs NCS Alt NCS
21-May-94 2130 B 185 VE2LVC W9ODI

Any stations with information on current events would be most welcomed. Also, those interested in discussing technical issues or who have questions about any particular aspect of OSCAR statellite operations, are encouraged to join the OPS Nets. If neither of the Net Control Stations show up, any participant is invited to act as the NCS.

"Slow Scanners" are invited to join the SSTV sessions on AO-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode S, and on Mode B following Mode S on Saturdays and Sundays. Join those sessions or convey your wishes for other SSTV skeds to wb6llo@amsat.org, and he will coordinate your efforts.

/EX
SB SAT @ AMSAT $ANS-133.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 133.04 FROM AMSAT HQ
SILVER SPRING, MD MAY 14, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-133.04

Weekly OSCAR Status Reports: 14-MAY-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF

Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The FO-20 ground command station has confirmed that the bird has been malfunctioning. The operational schedule announced previously is currently suspended and the analog mode will be continued indefinitely. Further operation schedule will be announced on and after 11-May-94. [Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

KO-25: KO-25 is operating normally. Please remember that the uplink frequency has been changed due to trouble with the other receiver. The current uplink now is 145.870 MHz. [WH6I]

AO-16: Working well. [WH6I]

LO-19: Operating normally. [WH6I]

KO-23: Operating Normally. [WH6I]

IO-26: Operating normally. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

725. ARLK019 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-05-16 03:56:37 UTC
From: mtracy@arrl.org
Message-ID: <$arlk019.1994@ampr.org>
Source record: 27479
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEP @ ARL $ARLK019
ARLK019 Keplerian data

ZCZC SK86
QST de W1AW
Keplerian Bulletin 19 ARLK019
>From ARRL Headquarters
Newington, CT May 14, 1994
To all radio amateurs

SB KEP ARL ARLK019
ARLK019 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94189.76632148 0.00073311 21920-3 0 22
2 99965 28.4664 14.3253 0003598 331.2635 28.7780 15.90320458 27
AO-10
1 14129U 83058B 94130.80459721 -.00000016 10000-3 0 2774
2 14129 27.1382 328.2037 6020986 177.1779 188.9849 2.05880044 54048
RS-10/11
1 18129U 87054A 94130.08415553 -.00000000 -16999-4 0 8968
2 18129 82.9265 357.0128 0012666 123.6132 236.6238 13.72335938344689
UO-11
1 14781U 84021B 94129.54582830 0.00000211 43582-4 0 6879
2 14781 97.7882 146.0792 0012814 37.7565 322.4528 14.69203696544636
RS-12/13
1 21089U 91007A 94133.21181356 0.00000023 89011-5 0 6865
2 21089 82.9238 37.3882 0028156 203.8370 156.1477 13.74040087163847
AO-13
1 19216U 88051B 94126.28995779 -.00000321 10000-4 0 9091
2 19216 57.8344 254.1456 7210927 340.7734 2.0051 2.09721388 13636
UO-14
1 20437U 90005B 94130.22723062 0.00000037 31238-4 0 9878
2 20437 98.5905 215.5169 0010604 307.4689 52.5521 14.29841089224162
AO-16
1 20439U 90005D 94132.73338135 0.00000023 25875-4 0 7874
2 20439 98.5990 219.1851 0010892 301.2386 58.7720 14.29895379224532
```

```
DO-17
1 20440U 90005E 94131.78158643 0.00000038 31885-4 0 7867
2 20440 98.5998 218.5557 0010905 302.2194 57.7929 14.30034790224412
WO-18
1 20441U 90005F 94130.21693527 0.00000032 29330-4 0 7888
2 20441 98.6000 217.0145 0011444 307.1754 52.8393 14.30009020224194
LO-19
1 20442U 90005G 94129.77786521 0.00000032 29460-4 0 7856
2 20442 98.5980 216.8261 0011803 308.0215 51.9900 14.30104622224141
FO-20
1 20480U 90013C 94129.46561045 -.00000008 46937-4 0 6823
2 20480 99.0315 288.6150 0541341 67.1736 298.5600 12.83225679199162
AO-21
1 21087U 91006A 94129.16206480 0.00000094 82657-4 0 4625
2 21087 82.9448 171.5920 0034734 189.9860 170.0610 13.74538981164221
UO-22
1 21575U 91050B 94130.18555526 0.00000044 29276-4 0 4890
2 21575 98.4367 205.4461 0008631 47.4109 312.7787 14.36912298147624
KO-23
1 22077U 92052B 94130.06403504 -.00000037 10000-3 0 3847
2 22077 66.0874 359.8032 0013522 299.1158 60.8506 12.86285570 81883
KO-25
1 22830U 93061H 94129.90200328 -.00000051 -31490-5 0 2883
2 22830 98.5572 203.7809 0010466 291.7365 68.2605 14.28050062 32237
IO-26
1 22826U 93061D 94129.74262760 0.00000014 23562-4 0 2830
2 22826 98.6558 205.9657 0009156 329.5650 30.5000 14.27724911 32201
AO-27
1 22825U 93061C 94130.24943309 0.00000025 27856-4 0 2833
2 22825 98.6559 206.4353 0008740 326.4316 33.6296 14.27621773 32273
PO-28
1 22829U 93061G 94133.19963416 0.00000044 35350-4 0 2777
2 22829 98.6517 209.4085 0009569 304.5811 55.4472 14.28023395 32706
Arsene
1 22654U 93031B 94124.94294243 -.00000120 00000-0 0 2516
2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202361 582
Mir
1 16609U 86017A 94133.01390049 0.00005352 73721-4 0 5938
2 16609 51.6479 2.3028 0014201 250.1408 109.8055 15.58980035470563

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
May 17, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

726. Connecting an FT-726R to a G3RUH modem?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-16 14:54:47 UTC
From: little@iamu.chi.dec.com
Message-ID: <1994May16.145447.22982@nntpd2.cxo.dec.com>
Source record: 27481

Given how popular the FT-726R was for satellite operation, certainly someone out there must have worked out the easiest way to connect one to a 9600 FSK modem. I've found the output of the demodulator for receive that is easy to access, but haven't found a similarly easy spot for injecting the xmit side into the modulator. If anyone knows of the easiest (least impact on the FT-726R) way to connect up a high speed modem, I'd sure like to hear about it.

73 es tnx,
Todd
N9MWB

727. Re: FCC REGS?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-16 18:19:24 UTC
From: dtiller@cscsun.rmc.edu
Message-ID: <CpwqwC.295@cscsun.rmc.edu>
Source record: 27480

Ronald Hobbs (ronald.hobbs@toadhall.com) wrote:
: *CROSSPOST ALERT*

: I have seen Ramsey Electronic's Ads for transmitters for "Dorm"
: stations,etc.

: I would like to put a station on the air that doesn't violate any FCC
: Regs or entail great licensening expense (or power). Does anybody know
: anything? I am a ham radio operator, don't want to jeopardize my ticket
: or run a pirate station. I have the "book" here but who knows chapter
: and verse?--the FCC lines are always busy.

Title 47 CFR, Part 15. This deals with low power transmitters. I'd suggest
getting a ramsey fm10a (I think). I've got one - it puts out a couple of mW,
and can be heard over 'dorm distances'. They provide a very thoughtful
guide as to what's legal and what's not, but it doesn't replace the CFR.

* CFR=Code of Federal Regulations, found at a large library near you!

--
David Tiller | Network Administrator | Voice: (804) 752-3710 |
dtiller@rmc.edu | n2kau/4 | Randolph-Macon College| Fax: (804) 752-7231 |
Brady Law critique removed | P.O. Box 5005 | ICBM: 37d 42' 43.75" N |
due to liberal PC pressure. | Ashland, Va 23005 | 77d 31' 32.19" W |

728. HELP! - Sharp PC-6200 lcd & docs

Newsgroup: rec.radio.amateur.space
Date: 1994-05-17 09:08:22 UTC
From: fmitch@netcom.com
Message-ID: <2r9cru$aan@sundog.tiac.net>
Source record: 27482
Cross-posted to: uk.radio.amateur,rec.radio.swap,rec.radio.amateur.space,rec.radio.amateur.policy,rec.radio.amateur.homebrew,rec.radio.amateur.equipment,rec.radio.amateur.digital.misc,rec.radio.amateur.antenna,aus.radio.packet,aus.radio.amsat,aus.radio

hi, mitch wa4osr here in mobile, alabama...

my sharp pc-6200 was dropped and the lcd display
was damaged... upon taking the display apart, one
of the surface mount column drivers was cracked...
rendering the display unusable... therefore,
i am in desperate need of the lcd display panel...
the part numbers on the display panel are LM64N671
and 90D13145W ... both numbers are on the panel...
my pc-6200 is actually a pc-6220, which
i think indicates that it has a 20 mb hard drive...

i bought the pc-6220 used with absolutely *NO* docs...
it has the 2400 baud internal modem... i need *ANY*
info, but especially would appreciate a copy of the
owner/operator manual... i will gladly pay for
copies/postage...

if anyone can help with a source of the lcd panel or
with the docs please email me or call me collect
at the below numbers...

thanks for any help/leads...

mitch, wa4osr

fmitch@netcom.com
205-476-4100 work
205-342-7259 home
11 Midtown Park, E.
Mobile, AL 36606

729. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-17 14:21:00 UTC
From: 0005018901@mcimail.COM
Message-ID: <90940517142109.0005018901PK1EM@mcimail.com>
Source record: 27483

Would like to receive satellite elements via MCIMail.
Address: 501-8901@MCIMAIL

John Wilcox NS1Z
MCI Mail ID: 501-8901
Current software AA4RE 2.1R

730. RS-15???

Newsgroup: rec.radio.amateur.space
Date: 1994-05-18 06:33:38 UTC
From: hansky@MB3.TU-Chemnitz.DE
Message-ID: <hansky.769242818@Otto>
Source record: 27484

Hello everybody,

some time ago I read the announcement of the RS-15 launch here in
the News. The launch was to be on May 1st. Has anybody some information
about this satellite? Was the launch delayed?

Karsten - DL3HRT.

e-mail: hansky@physik.th-zwickau.de

731. Mars Observer radio frequencies?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-18 17:53:38 UTC
From: jacob@altair.csustan.edu
Message-ID: <Cq0F1G.9MD@koko.csustan.edu>
Source record: 27486

Does anyone know the transmission frequencies of the Mars Observer space probe, the one that supposedly blew up? If it is indeen still transmitting, how difficult would it be to pick up the signal with ham gear? It seems top me that wh hams are in a unique position to prove once and for all if this machine is still working or not.

732. Eggbeater Antenna

Newsgroup: rec.radio.amateur.space
Date: 1994-05-18 18:26:46 UTC
From: ae517@FreeNet.Carleton.CA
Message-ID: <Cq0GKM.2Bw@freenet.carleton.ca>
Source record: 27485

There was a chap on this newsgroup about a month or so back who was inquiring as to the construction of the Eggbeater antenna. Just for his info, there is a short article in the May CQ magazine on page 29 that gives some detail.

Apparently, the two perpendicur loops are fed in the same manner as a turnstile antenna, ie 90 degrees out of phase. The author describes this as being close to isotropic in radiation pattern in free space.

I was under the impression, perhaps mistakenly, that a single loop had very little radiation parallel to the plane of the loop, c'est a dire, all the radiation was broadside to the loop. Could one of you antenna design mavens explain why is it that when two perpendicular loops are fed 90 degrees out of phase, it becomes an isotropic antenna.

As well, what numbers would one plug into Mininec to model this getup?

Russ Renaud
va3rr/aa8lu
va3rr@amsat.org
--

733. Re: Mars Observer radio frequencies?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-18 22:53:11 UTC
From: Greg <laborde@elm.jpl.nasa.gov>
Message-ID: <2re68n$b7p@elroy.jpl.nasa.gov>
Source record: 27487

In article <Cq0F1G.9MD@koko.csustan.edu> Dave Jacob,
jacob@altair.csustan.edu writes:
>with ham gear? It seems top me that wh hams are in a unique
>position to prove once and for all if this machine is still
>working or not.

Maybe. JPL's Deep Space Network used 70m dish antennas to listen for MO.
What kind of antenna do you have?

-Greg

734. LUSAT-1 (LO-19): Telemetry reports needed !!!

Newsgroup: rec.radio.amateur.space
Date: 1994-05-19 01:14:07 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.9D5Jmc1w165w@asarin.org.ar>
Source record: 27492

SB SAT @ AMSAT $LO19HELP2
LUSAT-1: News + Telemetry Needed!
On May 19th, from 03:23 to 03:38 UTC, LUSAT-1 command station (operated by Norberto Pennini, LU8DYF), had tried to start the satellite. This operation was unsuccessfull.

In the next passes, Norberto will restart the software load process.

PLEASE DO NOT USE THE SATELLITE !!!

Please note that the satellite will not be operational for regular users for the next 7 to 30 days period.

****
If you have ANY LUSAT-1 (LO-19) telemetry report for the period between May/17/94 at 02:00 and May/18/94 at 02:00 UTC, please send it to the LUSAT-1 command station, either via packet radio to LU8DYF @ LU8DYF.BA.ARG.SOAM and LU8DYF @ ANY ACTIVE SATELLITE, or via Internet to: lu8dyf@asarin.org.ar
****

We want to thanks LU8DYF and some other stations that, in a way or another, made possible this operation: LU1DBC, LU1FYZ, LU2FHE, LU2BDT, LU6DYD, LU7AKC, LU7DSU and LU8ENU.

73's de Eduardo Sweet, LU7AKC [G.R.A.P.S.]
packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar
/EX

735. Re: Mars Observer radio frequencies?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-19 02:00:36 UTC
From: rspear@sookit
Message-ID: <2reh84$pde@netline-fddi.jpl.nasa.gov>
Source record: 27488

Greg (laborde@elm.jpl.nasa.gov) wrote:
: In article <Cq0F1G.9MD@koko.csustan.edu> Dave Jacob,
: jacob@altair.csustan.edu writes:
: >with ham gear? It seems top me that wh hams are in a unique
: >position to prove once and for all if this machine is still
: >working or not.

: Maybe. JPL's Deep Space Network used 70m dish antennas to listen for MO.
: What kind of antenna do you have?

: -Greg

greg -

the frequencies being looked for are vhf . . . they are tones that were
meant to be used for vlbi. a proposal here at jpl suggested that a yagi
antenna be mounted to the 70 meter dish (focused on the dish) to try to
pick up the signals . . . some engineers have snickered at the idea . . . i
doubt if any amateur would be able to receive the signals.

regards, richard kd6lwd

rspear@sookit.jpl.nasa.gov
all disclaimers apply

736. Shuttle sched. and retransmitting shuttle audio

Newsgroup: rec.radio.amateur.space
Date: 1994-05-19 03:48:16 UTC
From: keithm@wicat.com
Message-ID: <1994May19.034816.11712@wicat.com>
Source record: 27489

Some questions...

Does anyone have a schedule of planned shuttle flights
for the next few months to a year? If so, please e-mail
me.

What is the procedure for re-transmitting shuttle audio?
I know that some hams just re-transmit the audio from
NASA select TV from the satellite. Is this the correct
way? What about permission to re-transmit? I have heard
that NASA has given a blanket permission. Is this so?

Thanks for the info in advance.

--
Keith McQueen, NACT, Inc | My opinions are |
Packet: n7hmf @ nv7v.UT.USA.NA | all mine... |
Internet: keithm@wicat.com | ...so there! |

737. Re: RS-15???

Newsgroup: rec.radio.amateur.space
Date: 1994-05-19 12:41:42 UTC
From: sford@arrl.org
Message-ID: <1994May19.124142.5750@arrl.org>
Source record: 27491

Karsten Hansky (hansky@MB3.TU-Chemnitz.DE) wrote:
: Hello everybody,

: some time ago I read the announcement of the RS-15 launch here in
: the News. The launch was to be on May 1st. Has anybody some information
: about this satellite? Was the launch delayed?

: Karsten - DL3HRT.

: e-mail: hansky@physik.th-zwickau.de

RS-15 has not been launched. It may yet fly this year depending on
future schedule revisions.

The next ham satellite to launch is UNAMSAT, presently scheduled for
a June 15 lift-off onboard a Russian rocket.

73 . . .

Steve, WB8IMY
ARRL

738. Re: Mars Observer radio frequencies?

Newsgroup: rec.radio.amateur.space
Date: 1994-05-19 15:53:45 UTC
From: kinzer@dtsdev0.sps.mot.com
Message-ID: <1994May19.155345.2242@newsgate.sps.mot.com>
Source record: 27490

In article <2reh84$pde@netline-fddi.jpl.nasa.gov> rspear@sookit.jpl.nasa.gov writes:

>the frequencies being looked for are vhf . . . they are tones that were
>meant to be used for vlbi. a proposal here at jpl suggested that a yagi
>antenna be mounted to the 70 meter dish (focused on the dish) to try to
>pick up the signals . . .

There you have it. Another big NASA snafu. The darn thing has probably
been working fine all along, but the engineers are trying to hear a VHF
signal with an antenna for the HF bands. Typical.

-dave
(snicker)

739. ORBS$140.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-20 13:34:34 UTC
From: Richard Campbell <G_RCAMPBELL@qualcomm.com>
Message-ID: <$orbs-140.o.1994@ampr.org>
Source record: 27495
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-140.O
Orbital Elements 140.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM N3FKV HEWITT, TX May 20, 1994
BID: $ORBS-140.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94135.65640866
Element set: 278
Inclination: 27.1386 deg
RA of node: 327.4455 deg
Eccentricity: 0.6021198
Arg of perigee: 178.4592 deg
Mean anomaly: 184.9623 deg
Mean motion: 2.05881022 rev/day
Decay rate: -1.51e-06 rev/day^2
Epoch rev: 8211
Checksum: 309

Satellite: UO-11
Catalog number: 14781
Epoch time: 94134.04076705
Element set: 688
Inclination: 97.7881 deg
RA of node: 150.3647 deg
Eccentricity: 0.0012686
Arg of perigee: 24.2878 deg
Mean anomaly: 335.8924 deg
Mean motion: 14.69205908 rev/day
Decay rate: 2.01e-06 rev/day^2
Epoch rev: 54529
Checksum: 331

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94134.60454005
Element set: 897
Inclination: 82.9259 deg
RA of node: 353.6714 deg
Eccentricity: 0.0012816
Arg of perigee: 112.1233 deg
```

Mean anomaly: 248.1285 deg
Mean motion: 13.72336655 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 34530
Checksum: 292

Satellite: AO-13
Catalog number: 19216
Epoch time: 94136.30336564
Element set: 805
Inclination: 57.8496 deg
RA of node: 252.4327 deg
Eccentricity: 0.7207599
Arg of perigee: 341.6930 deg
Mean anomaly: 2.0395 deg
Mean motion: 2.09724363 rev/day
Decay rate: -1.45e-06 rev/day^2
Epoch rev: 4534
Checksum: 310

Satellite: FO-20
Catalog number: 20480
Epoch time: 94133.90960643
Element set: 683
Inclination: 99.0321 deg
RA of node: 292.2171 deg
Eccentricity: 0.0541449
Arg of perigee: 57.0939 deg
Mean anomaly: 308.1058 deg
Mean motion: 12.83225410 rev/day
Decay rate: -4.2e-07 rev/day^2
Epoch rev: 19973
Checksum: 298

Satellite: AO-21
Catalog number: 21087
Epoch time: 94136.51415561
Element set: 464
Inclination: 82.9441 deg
RA of node: 166.1517 deg
Eccentricity: 0.0035247
Arg of perigee: 169.4328 deg
Mean anomaly: 190.7577 deg
Mean motion: 13.74539324 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16523
Checksum: 313

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94133.21181356

Element set: 686
Inclination: 82.9238 deg
RA of node: 37.3882 deg
Eccentricity: 0.0028156
Arg of perigee: 203.8370 deg
Mean anomaly: 156.1477 deg
Mean motion: 13.74040087 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 16384
Checksum: 305

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94124.94294242
Element set: 217
Inclination: 1.7729 deg
RA of node: 101.4452 deg
Eccentricity: 0.2921942
Arg of perigee: 180.0752 deg
Mean anomaly: 180.1868 deg
Mean motion: 1.42202360 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 58
Checksum: 262

/EX
SB KEPS @ AMSAT $ORBS-140.D
Orbital Elements 140.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM N3FKV HEWITT, TX May 20, 1994
BID: $ORBS-140.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94134.77578158
Element set: 988
Inclination: 98.5905 deg
RA of node: 220.0041 deg
Eccentricity: 0.0010362
Arg of perigee: 293.1621 deg
Mean anomaly: 66.8470 deg
Mean motion: 14.29842002 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 22481
Checksum: 300

Satellite: AO-16
Catalog number: 20439
Epoch time: 94132.73338135
Element set: 787

Inclination: 98.5990 deg
RA of node: 219.1851 deg
Eccentricity: 0.0010892
Arg of perigee: 301.2386 deg
Mean anomaly: 58.7720 deg
Mean motion: 14.29895379 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 22453
Checksum: 327

Satellite: DO-17
Catalog number: 20440
Epoch time: 94136.25955384
Element set: 787
Inclination: 98.5998 deg
RA of node: 222.9797 deg
Eccentricity: 0.0010729
Arg of perigee: 288.2946 deg
Mean anomaly: 71.7069 deg
Mean motion: 14.30035495 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 22505
Checksum: 343

Satellite: WO-18
Catalog number: 20441
Epoch time: 94134.76495185
Element set: 789
Inclination: 98.5998 deg
RA of node: 221.5067 deg
Eccentricity: 0.0011130
Arg of perigee: 292.6568 deg
Mean anomaly: 67.3433 deg
Mean motion: 14.30009656 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 22484
Checksum: 324

Satellite: LO-19
Catalog number: 20442
Epoch time: 94134.18564869
Element set: 786
Inclination: 98.5992 deg
RA of node: 221.1823 deg
Eccentricity: 0.0011669
Arg of perigee: 294.7102 deg
Mean anomaly: 65.2867 deg
Mean motion: 14.30105216 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 22477
Checksum: 317

Satellite: UO-22
Catalog number: 21575
Epoch time: 94134.22431410
Element set: 490
Inclination: 98.4367 deg
RA of node: 209.4047 deg
Eccentricity: 0.0008606
Arg of perigee: 36.3601 deg
Mean anomaly: 323.8167 deg
Mean motion: 14.36913183 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 14820
Checksum: 285

Satellite: KO-23
Catalog number: 22077
Epoch time: 94134.65134563
Element set: 385
Inclination: 66.0866 deg
RA of node: 350.2005 deg
Eccentricity: 0.0013609
Arg of perigee: 297.5548 deg
Mean anomaly: 62.4086 deg
Mean motion: 12.86285709 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8247
Checksum: 316

Satellite: AO-27
Catalog number: 22825
Epoch time: 94134.73495974
Element set: 284
Inclination: 98.6556 deg
RA of node: 210.8764 deg
Eccentricity: 0.0008618
Arg of perigee: 313.7678 deg
Mean anomaly: 46.2786 deg
Mean motion: 14.27622306 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 3291
Checksum: 334

Satellite: IO-26
Catalog number: 22826
Epoch time: 94134.22782802
Element set: 284
Inclination: 98.6556 deg
RA of node: 210.4081 deg
Eccentricity: 0.0008900
Arg of perigee: 317.7860 deg
Mean anomaly: 42.2636 deg
Mean motion: 14.27726245 rev/day

Decay rate: 1.05e-06 rev/day^2
Epoch rev: 3284
Checksum: 294

Satellite: KO-25
Catalog number: 22830
Epoch time: 94134.17599451
Element set: 289
Inclination: 98.5539 deg
RA of node: 207.9656 deg
Eccentricity: 0.0010519
Arg of perigee: 278.3913 deg
Mean anomaly: 81.6093 deg
Mean motion: 14.28052000 rev/day
Decay rate: 7.8e-07 rev/day^2
Epoch rev: 3284
Checksum: 318

/EX
SB KEPS @ AMSAT $ORBS-140.W
Orbital Elements 140.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM N3FKV HEWITT, TX May 20, 1994
BID: $ORBS-140.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94135.11734660
Element set: 810
Inclination: 99.0565 deg
RA of node: 185.2161 deg
Eccentricity: 0.0014517
Arg of perigee: 316.3805 deg
Mean anomaly: 43.6219 deg
Mean motion: 14.13614434 rev/day
Decay rate: 1.08e-06 rev/day^2
Epoch rev: 48567
Checksum: 294

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94132.97675335
Element set: 708
Inclination: 98.5095 deg
RA of node: 143.0541 deg
Eccentricity: 0.0014380
Arg of perigee: 72.1046 deg
Mean anomaly: 288.1700 deg
Mean motion: 14.24883234 rev/day
Decay rate: 3.2e-07 rev/day^2

Epoch rev: 39759
Checksum: 315

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94136.20592678
Element set: 628
Inclination: 99.1704 deg
RA of node: 124.3366 deg
Eccentricity: 0.0010859
Arg of perigee: 221.3105 deg
Mean anomaly: 138.7246 deg
Mean motion: 14.12985134 rev/day
Decay rate: 1.06e-06 rev/day^2
Epoch rev: 29070
Checksum: 295

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94136.86006307
Element set: 45
Inclination: 82.5500 deg
RA of node: 291.6361 deg
Eccentricity: 0.0006810
Arg of perigee: 17.9875 deg
Mean anomaly: 342.1475 deg
Mean motion: 13.04407836 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21881
Checksum: 279

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94136.55798805
Element set: 965
Inclination: 98.8364 deg
RA of node: 157.6984 deg
Eccentricity: 0.0016484
Arg of perigee: 95.2584 deg
Mean anomaly: 265.0463 deg
Mean motion: 14.01334974 rev/day
Decay rate: 4.24e-06 rev/day^2
Epoch rev: 18927
Checksum: 361

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94132.58504276
Element set: 795
Inclination: 82.5258 deg
RA of node: 174.3059 deg

Eccentricity: 0.0014158
Arg of perigee: 141.2539 deg
Mean anomaly: 218.9638 deg
Mean motion: 13.83580685 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 18283
Checksum: 332

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94133.58950241
Element set: 693
Inclination: 82.5414 deg
RA of node: 194.0495 deg
Eccentricity: 0.0011485
Arg of perigee: 273.4571 deg
Mean anomaly: 86.5244 deg
Mean motion: 13.16462067 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14680
Checksum: 293

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94136.46935316
Element set: 34
Inclination: 98.6184 deg
RA of node: 164.9422 deg
Eccentricity: 0.0012780
Arg of perigee: 334.1017 deg
Mean anomaly: 25.9523 deg
Mean motion: 14.22404550 rev/day
Decay rate: 1.63e-06 rev/day^2
Epoch rev: 15602
Checksum: 272

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94134.01812282
Element set: 702
Inclination: 82.5508 deg
RA of node: 140.8780 deg
Eccentricity: 0.0011738
Arg of perigee: 291.9740 deg
Mean anomaly: 68.0115 deg
Mean motion: 13.16829949 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13196
Checksum: 299

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94132.77291839
Element set: 295
Inclination: 82.5480 deg
RA of node: 234.4911 deg
Eccentricity: 0.0022126
Arg of perigee: 329.5225 deg
Mean anomaly: 30.4648 deg
Mean motion: 13.83005585 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 3519
Checksum: 302

/EX
SB KEPS @ AMSAT $ORBS-140.M
Orbital Elements 140.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM N3FKV HEWITT, TX May 20, 1994
BID: $ORBS-140.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94133.19963416
Element set: 277
Inclination: 98.6517 deg
RA of node: 209.4085 deg
Eccentricity: 0.0009569
Arg of perigee: 304.5811 deg
Mean anomaly: 55.4472 deg
Mean motion: 14.28023395 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 3270
Checksum: 307

Satellite: MIR
Catalog number: 16609
Epoch time: 94139.87954077
Element set: 613
Inclination: 51.6468 deg
RA of node: 327.9164 deg
Eccentricity: 0.0001412
Arg of perigee: 325.9678 deg
Mean anomaly: 34.1223 deg
Mean motion: 15.56155327 rev/day
Decay rate: 2.7705e-04 rev/day^2
Epoch rev: 47163
Checksum: 319

Satellite: HUBBLE
Catalog number: 20580

Epoch time: 94137.15152928
Element set: 354
Inclination: 28.4681 deg
RA of node: 75.3297 deg
Eccentricity: 0.0006448
Arg of perigee: 124.3383 deg
Mean anomaly: 235.7814 deg
Mean motion: 14.90600387 rev/day
Decay rate: 4.78e-06 rev/day^2
Epoch rev: 2475
Checksum: 306

Satellite: GRO
Catalog number: 21225
Epoch time: 94132.78355012
Element set: 91
Inclination: 28.4611 deg
RA of node: 117.8794 deg
Eccentricity: 0.0003807
Arg of perigee: 168.2185 deg
Mean anomaly: 191.8514 deg
Mean motion: 15.40771764 rev/day
Decay rate: 2.428e-05 rev/day^2
Epoch rev: 5147
Checksum: 292

Satellite: UARS
Catalog number: 21701
Epoch time: 94132.90841328
Element set: 517
Inclination: 56.9866 deg
RA of node: 300.4430 deg
Eccentricity: 0.0005491
Arg of perigee: 94.2247 deg
Mean anomaly: 265.9415 deg
Mean motion: 14.96527573 rev/day
Decay rate: 2.827e-05 rev/day^2
Epoch rev: 14565
Checksum: 308

/EX
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740. ORBS$140.2liners

Newsgroup: rec.radio.amateur.space
Date: 1994-05-20 13:36:10 UTC
From: Richard Campbell <G_RCAMPBELL@qualcomm.com>
Message-ID: <$orbs-140.n.1994@ampr.org>
Source record: 27493
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-140.N
2Line Orbital Elements 140.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM N3FKV HEWITT, TX May 20, 1994
BID: $ORBS-140.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94135.65640866 -.00000151 00000-0 10000-3 0 2786
2 14129 27.1386 327.4455 6021198 178.4592 184.9623 2.05881022 82112
UO-11
1 14781U 84021B 94134.04076705 .00000201 00000-0 41983-4 0 6883
2 14781 97.7881 150.3647 0012686 24.2878 335.8924 14.69205908545296
RS-10/11
1 18129U 87054A 94134.60454005 .00000043 00000-0 30226-4 0 8971
2 18129 82.9259 353.6714 0012816 112.1233 248.1285 13.72336655345304
AO-13
1 19216U 88 51 B 94136.30336564 -.00000145 00000-0 99999-5 0 8051
2 19216 57.8496 252.4327 7207599 341.6930 2.0395 2.09724363 45341
FO-20
1 20480U 90013C 94133.90960643 -.00000042 00000-0 -27161-4 0 6833
2 20480 99.0321 292.2171 0541449 57.0939 308.1058 12.83225410199736
AO-21
1 21087U 91006A 94136.51415561 .00000094 00000-0 82657-4 0 4647
2 21087 82.9441 166.1517 0035247 169.4328 190.7577 13.74539324165233
RS-12/13
1 21089U 91007A 94133.21181356 .00000023 00000-0 89011-5 0 6866
2 21089 82.9238 37.3882 0028156 203.8370 156.1477 13.74040087163847
ARSENE
1 22654U 93 31 B 94124.94294242 -.00000051 00000-0 00000 0 0 2170
2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202360 581
UO-14
1 20437U 90005B 94134.77578158 .00000049 00000-0 36012-4 0 9886
2 20437 98.5905 220.0041 0010362 293.1621 66.8470 14.29842002224819
AO-16
1 20439U 90005D 94132.73338135 .00000023 00000-0 25875-4 0 7875
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2 20439 98.5990 219.1851 0010892 301.2386 58.7720 14.29895379224532
DO-17
1 20440U 90005E 94136.25955384 .00000042 00000-0 33414-4 0 7878
2 20440 98.5998 222.9797 0010729 288.2946 71.7069 14.30035495225054
WO-18
1 20441U 90005F 94134.76495185 .00000026 00000-0 27107-4 0 7897
2 20441 98.5998 221.5067 0011130 292.6568 67.3433 14.30009656224848
LO-19
1 20442U 90005G 94134.18564869 .00000034 00000-0 30214-4 0 7869
2 20442 98.5992 221.1823 0011669 294.7102 65.2867 14.30105216224772
UO-22
1 21575U 91050B 94134.22431410 .00000058 00000-0 34175-4 0 4906
2 21575 98.4367 209.4047 0008606 36.3601 323.8167 14.36913183148208
KO-23
1 22077U 92052B 94134.65134563 -.00000037 00000-0 10000-3 0 3854
2 22077 66.0866 350.2005 0013609 297.5548 62.4086 12.86285709 82471
AO-27
1 22825U 93061C 94134.73495974 .00000033 00000-0 31405-4 0 2847
2 22825 98.6556 210.8764 0008618 313.7678 46.2786 14.27622306 32917
IO-26
1 22826U 93061D 94134.22782802 .00000105 00000-0 60241-4 0 2841
2 22826 98.6556 210.4081 0008900 317.7860 42.2636 14.27726245 32846
KO-25
1 22830U 93061H 94134.17599451 .00000078 00000-0 48923-4 0 2893
2 22830 98.5539 207.9656 0010519 278.3913 81.6093 14.28052000 32846
NOAA-9
1 15427U 84123A 94135.11734660 .00000108 00000-0 81386-4 0 8108
2 15427 99.0565 185.2161 0014517 316.3805 43.6219 14.13614434485679
NOAA-10
1 16969U 86073A 94132.97675335 .00000032 00000-0 31840-4 0 7082
2 16969 98.5095 143.0541 0014380 72.1046 288.1700 14.24883234397591
NOAA-11
1 19531U 88089A 94136.20592678 .00000106 00000-0 82016-4 0 6281
2 19531 99.1704 124.3366 0010859 221.3105 138.7246 14.12985134290700
MET-3/3
1 20305U 89086A 94136.86006307 .00000044 00000-0 10000-3 0 458
2 20305 82.5500 291.6361 0006810 17.9875 342.1475 13.04407836218814
FY-1/2
1 20788U 90081A 94136.55798805 .00000424 00000-0 30916-3 0 9658
2 20788 98.8364 157.6984 0016484 95.2584 265.0463 14.01334974189270
MET-2/20
1 20826U 90086A 94132.58504276 .00000049 00000-0 31273-4 0 7954
2 20826 82.5258 174.3059 0014158 141.2539 218.9638 13.83580685182839
MET-3/4
1 21232U 91030A 94133.58950241 .00000050 00000-0 10000-3 0 6937
2 21232 82.5414 194.0495 0011485 273.4571 86.5244 13.16462067146800
NOAA-12
1 21263U 91032A 94136.46935316 .00000163 00000-0 92707-4 0 348
2 21263 98.6184 164.9422 0012780 334.1017 25.9523 14.22404550156024
MET-3/5
```

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1 21655U 91056A 94134.01812282 .00000051 00000-0 10000-3 0 7027
2 21655 82.5508 140.8780 0011738 291.9740 68.0115 13.16829949131962
MET-2/21
1 22782U 93055A 94132.77291839 .00000056 00000-0 37429-4 0 2957
2 22782 82.5480 234.4911 0022126 329.5225 30.4648 13.83005585 35196
POSAT
1 22829U 93061G 94133.19963416 .00000044 00000-0 35350-4 0 2778
2 22829 98.6517 209.4085 0009569 304.5811 55.4472 14.28023395 32706
MIR
1 16609U 86017A 94139.87954077 .00027705 00000-0 39399-3 0 6137
2 16609 51.6468 327.9164 0001412 325.9678 34.1223 15.56155327471630
HUBBLE
1 20580U 90 37 B 94137.15152928 .00000478 00000-0 40129-4 0 3545
2 20580 28.4681 75.3297 0006448 124.3383 235.7814 14.90600387 24751
GRO
1 21225U 91027B 94132.78355012 .00002428 00000-0 51424-4 0 910
2 21225 28.4611 117.8794 0003807 168.2185 191.8514 15.40771764 51470
UARS
1 21701U 91063B 94132.90841328 .00002827 00000-0 26761-3 0 5174
2 21701 56.9866 300.4430 0005491 94.2247 265.9415 14.96527573145656
/EX
-------
```

741. Slipping Sat Ants

Newsgroup: rec.radio.amateur.space
Date: 1994-05-20 14:51:51 UTC
From: icumming@news.delphi.com
Message-ID: <2riiq7$q6j@news.delphi.com>
Source record: 27494

I am sick and tired of climbing my satellite mast to fix my
satellite antennas that have slipped on my fiberglass boom.
I have the KLM long crossed yagis (very long booms).
I have tightened the hell out of the bolts and am always
concerned about cracking the #*$%^^@ fiberglass.
I am somewhat new to satellite stuff ... have I missed
some obvious trick (or is everyone swinging around up there
swearing at their antennas?)
Thanks Ian KB1SG

742. Locating Author of Solar.Exe(Matthew Merrill)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-21 00:12:08 UTC
From: greilly@pilot.njin.net
Message-ID: <May.20.20.12.08.1994.13603@pilot.njin.net>
Source record: 27496

I am looking for Matthew Merrill, author of "Solar.Exe". My classes
recently used his program and would like to write to him.
Last address:
Matthew Merrill
8927 Virginia Ave. Apt. B
South Gate, Ca 90280
Program:Solar Version 1.40 (July 5, 1991)
Thank you for any help.

Jean A. Reilly
passaic_hs@spcvxa.spc.

743. amsat mailing list

Newsgroup: rec.radio.amateur.space
Date: 1994-05-21 00:53:22 UTC
From: rsm@world.std.com
Message-ID: <Cq4nsy.lpI@world.std.com>
Source record: 27497

I would like to get on the amsat mailing list.
I sent in a reauest 3 weeks ago, but no response.
Any suggestions?

Also are there any other good mailing lists??
thanks
bob KA6NOC

744. Re: amsat mailing list

Newsgroup: rec.radio.amateur.space
Date: 1994-05-21 11:18:40 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <2rkqmh$gk0@usenet.INS.CWRU.Edu>
Source record: 27498

(KA6NOC writes that he asked to join the AMSAT mailing list 3 weeks ago and has had no response)

I'm one week and holding now myself. According to the AMSAT journal, the list is administered by a human, not a machine, and response can be slow at times. But 3 weeks??

Anyhow, I'm glad it's not just me. I was afraid I'd bungled the request.

N9LTD

745. Re: Slipping Sat Ants

Newsgroup: rec.radio.amateur.space
Date: 1994-05-21 15:22:52 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994May21.152252.13039@ke4zv.atl.ga.us>
Source record: 27499

In article <2riiq7$q6j@news.delphi.com> icumming@news.delphi.com (ICUMMINGS@DELPHI.COM) writes:
>I am sick and tired of climbing my satellite mast to fix my
>satellite antennas that have slipped on my fiberglass boom.
>I have the KLM long crossed yagis (very long booms).
>I have tightened the hell out of the bolts and am always
>concerned about cracking the #*$%^^@ fiberglass.
>I am somewhat new to satellite stuff ... have I missed
>some obvious trick (or is everyone swinging around up there
>swearing at their antennas?)
> Thanks Ian KB1SG

Gee, I guess no one in all of amateur radio owns a drill but me. :-)
Drill the mast and *pin* the antennas in place with a sheetmetal screw.
Works for me.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

746. WANTED: E-mail address for info from amsat.org

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 04:19:22 UTC
From: wy1z@bach.coe.neu.edu
Message-ID: <WY1Z.94May22001922@bach.coe.neu.edu>
Source record: 27500
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

I am looking for the contact address to obtain info from amsat.org.

I've tried info@amsat.org and help@amsat.org, but both messages bounced.

Thanks.

Scott

--

```
==============================================================================
| Scott Ehrlich Amateur Radio: wy1z AMPRnet: wy1z@wa1phy.ampr.org |
| Internet: wy1z@neu.edu BITnet: wy1z@NUHUB AX.25: wy1z@wa1phy.ma.usa.na |
|----------------------------------------------------------------------------|
| Maintainer of the Boston Amateur Radio Club hamradio FTP area on |
| oak.oakland.edu - /pub/hamradio |
==============================================================================
```

747. Re: Slipping Sat Ants

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 14:19:44 UTC
From: zlau@arrl.org
Message-ID: <1994May22.141944.17484@arrl.org>
Source record: 27502

ICUMMINGS@DELPHI.COM KB1SG (icumming@news.delphi.com) wrote:
: I am sick and tired of climbing my satellite mast to fix my
: satellite antennas that have slipped on my fiberglass boom.
: I have the KLM long crossed yagis (very long booms).
: I have tightened the hell out of the bolts and am always
: concerned about cracking the #*$%^^@ fiberglass.
: I am somewhat new to satellite stuff ... have I missed
: some obvious trick (or is everyone swinging around up there
: swearing at their antennas?)

Well, what NC1I/K1FO (ever wonder how they keep all those EME yagi pointing in the same direction?) did was to use custom clamps machined to match the boom/tubing diameter. The idea is to maximize the effective surface area.

I've found this works pretty well even with clamps made out of sheet aluminum or square aluminum tubing. I use a hole punch to make holes in sheet metal. For the latter I ended up using a file....

This approach doesn't weaken the boom with holes.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

748. DO-17 software

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 14:54:15 UTC
From: duffin@ee.utah.EDU
Message-ID: <9405221454.AA01037@ee.utah.edu>
Source record: 27501

Hi all,

I am just curious if anyone has the program to decode telemetry
from DO-17. If so, where can I get it from?

Thanks in advance,
Jon

****
* Jon Duffin University of Utah *
* duffin@ee.utah.edu Dept. of Electrical Engineering *
* KB7TJJ *
****

749. ANS-140 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 16:52:18 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-140.01.1994@ampr.org>
Source record: 27505
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-140.01
AMSAT-NA COMMENTS TO NTIA

HR AMSAT NEWS SERVICE BULLETIN 140.01 FROM AMSAT HQ
SILVER SPRING, MD MAY 21, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-140.01

AMSAT-NA Sends Comments To the National Telecomunications & Information Administration (NTIA)

The Radio Amateur Satellite Corporation has responded to proposals contained in a notice from the National Telecommunications and Information Administration (NTIA). That notice, entitled Preliminary Spectrum Reallocation Report, was released in February and was prepared pursuant to Title VI of the Omnibus Budget Reconciliation Act of 1993. In that Act, Congress mandated that the U.S. Government re-allocate to the private sector 200 MHz of spectrum below 5 GHz, 100 MHz of it below 3 GHz. Since Amateur Radio's use of the microwave bands is on a secondary basis to Government applications, mostly military, this proceeding could have a significant impact on our future access to these frequencies.

In its comments filed May 11 by AMSAT-NA VP for Government Liaison Perry Klein (W3PK), AMSAT-NA asked the NTIA for wider amateur and amateur-satellite service bands at 13cm than proposed in its Preliminary Report. It proposed that 2300 to 2310, 2390 to 2400 and 2402 to 2417 MHz be turned over to FCC for allocation to commercial users. In omitting 2400 to 2402 MHz from this re-allocation, NTIA noted amateur satellite use of this band. This would presumably leave 2400 to 2402 and 2417 to 245 MHz available to amateurs. The present 13cm amateur band consists of 2300-2310 and 2390-2450 MHz.

AMSAT-NA proposed a primary amateur/amateur satellite allocation of 2400-2410 MHz plus access to as much of the 2410 to 2450 MHz band as possible on a shared basis. In support of this request, AMSAT-NA cited the likelihood of greatly increased demand for amateur satellite operations in the 13 cm band in coming years, far more than can be accommodated within 2400-2402 MHz; the unsuitability of 2417-2450 MHz for amateur satellite downlinks because of interference from such devices as microwave ovens; and the need to coordinate amateur-satellite allocations internationally so that they are available on a global basis. In addition, AMSAT-NA proposed that a narrow band of 1-2 MHz, somewhere between 2300 and 2400 MHz, be allocated to the amateur service on a primary basis to accommodate the experimental weak-signal tropo and EME work now carried out around 2304 MHz.

AMSAT-NA comments were prepared by a group consisting of Perry Klein (W3PK), Ray Soifer (W2RS), Jan King (W3GEY) and Bill Tynan (W3XO).

[The AMSAT News Service (ANS) would like to thank this group for the material used in this bulletin.]

/EX
SB SAT @ AMSAT $ANS-140.02
LO-19 & IO-26 OBC'S CRASH

HR AMSAT NEWS SERVICE BULLETIN 140.02 FROM AMSAT HQ
SILVER SPRING, MD MAY 21, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-140.02

LO-19's & IO-26's On-board Computers Crash After A Single Event Upset (SEU)

It has been reported this week that LUSAT-OSCAR-19's On-Board Computer (OBC) had "crashed" after having experienced what is known in the aerospace industry as a Single Event Upset (SEU). This phenomenon is caused by high energy particles in space "effecting" changes in the "state" inside of memory chips and/or other electronic components. In simple terms, an SEU will change a bit from a "1" to a "0" or visa-versa in Random Access Memory (RAM) chips. All MICROSATs have software specifically desgined to handle this problem. However, this software is not "bullet-proof." The software can only correct one "state" change at a time. If two "state" changes occur simultaneously, there is a good possibility that they will occur in RAM memory locations that will eventually lead to an OBC "crash."

The problem with LO-19 was first noticed on 16-MAY-94 over Argentina when LU1JBR was working it then he noticed suddenly that the satellite simply "disappeared." On the evening of 17-MAY-94, LO-19's ground command station, operated by Norberto Pennini (LU8DYF) was able to successfully reset the OBC. AMSAT-LU ground station LU8DYF requests that all users of LO-19 to PLEASE REFRAIN FROM USING IT FOR SEVERAL WEEKS! The reloading of the software will take several weeks along with extensive tests to be performed to insure all is working properly. AMSAT-LU requests that if anyone was collecting telemetry between 17-MAY-94 at 02:00 UTC until 18-MAY-94 around 02:00 UTC that they please forward it to the following addresses: via packet radio to LU8DYF @ LU8DYF.BA.ARG.SOAM and/or LU8DYF @ ON ANY ACTIVE SATELLITE, or via Internet to: lu8dyf@asarin.org.ar. This will certainly assist in the recovery efforts by helping the AMSAT-LU group understand this crash. All users are asked to please be patient as the AMSAT-LU ground command team reloads the operating system software for LO-19.

Alberto Zagni (I2KBD) also reports that the the same high energy eruption that caused the LO-19's OBC to "crash" has also cause IO-26's OBC to "crash." I2KBD reports that the problem occured about the same time period and feels that this was due to the fact the Sun was spewing out alot of highly charged particles. I2KBD says that it will take several days to get the "kernal" and Integrated Housekeeping Tasks (IHT) software reloaded. He too asks that all IO-26 users to please be patient as they bring IO-26 back

"on-line."

Please stay tunned to the AMSAT News Service (ANS) bulletins for further status on the reloading and recovery of LO-19 and IO-26.

[The AMSAT News Service (ANS) would like to thank LU2DTZ, LU8DYF, and I2KBD for the information which went into this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-140.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 140.03 FROM AMSAT HQ
SILVER SPRING, MD MAY 21, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-140.03

Weekly OSCAR Status Reports: 21-MAY-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The analog mode will be continued indefinitely.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

KO-25: Please note that the KO-25 uplink was switched back to 145.980 MHz on about 10-May-94. [K6OYY]

AO-16: Working well. [WH6I]

LO-19: DON'T USE LO-19 UNTIL FURTHER NOTICE! [LW2DTZ]

IO-26: IO-26 has sustained a SEU and users are asked to refrain from trying to use it. [I2KBD]

KO-23: Operating Normally. [WH6I]

IO-26: Operating normally. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you

provide will be of value to all OSCAR enthusiasts.

/EX

750. Re: WANTED: E-mail address for info from amsat.org

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 20:04:25 UTC
From: pschleck@unomaha.edu
Message-ID: <2rods9$2v2@hecate.umd.edu>
Source record: 27503
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

In article <WY1Z.94May22001922@bach.coe.neu.edu>,
Scott Ehrlich <wy1z@bach.coe.neu.edu> wrote:
>I am looking for the contact address to obtain info from amsat.org.
>
>I've tried info@amsat.org and help@amsat.org, but both messages bounced.
>
>Thanks.
>
>Scott
>

As the maintainer of the "Elmers list" for this newsgroup (among others),
I too would be interested in this information. I know several people
who have AMSAT E-mail addresses, one or two being on the Elmers list
(such as Bob Carpenter, W3OTC), but don't have any official customer
service contacts for membership information, files, or mailing lists.

If you wish to submit information about AMSAT, or find out more about
the Elmers list and how to obtain a current copy of it, please finger
pschleck@unomaha.edu or send E-mail to elmers-request@unomaha.edu.

On a related subject, something that the moderator of rec.radio.info
(Mark Salyzyn, VE6MGS) and I are very interested in is who is relaying the
AMSAT-related bulletins like the Orbital Elements and Space News to the
Info-Hams@ucsd.edu gateway. What is currently happening is that their
respective maintainers are submitting them to Mark who cross-posts them
to rec.radio.amateur.space and rec.radio.info (which causes them to be
relayed to the Ham-Space and Radio-Info mailing lists), then they appear
on Info-Hams (rec.radio.amateur.misc). E-mail to the maintainers
reveals that they are not the ones doing the duplicate posting, a person
or persons unknown within AMSAT is.

It's certainly not our place to dictate how bulletins should be posted,
or even who should post them, but if they are going to posted to several
newsgroups, a simultaneous cross-post is most desirable (propagating a
single article within news that will appear in most modern newsreaders
only once, although it will be duplicated on the mailing lists). Also,
if there will be multiple submitters to news of bulletins with packet-radio
BID's, they should use the Message-ID encapsulation convention like the
following:

SB BID$NNN @ DISTRIBUTION

becomes:

Message-ID: <bid$nnn.1994@ampr.org>

In this way any one news site will have only one copy of the bulletin, regardless of how many submitters post it.

Mark is perfectly willing to help anyone manage the complexity in properly formatting their bulletins. This could be as simple as mailing it to a different E-mail address (rec-radio-info@ve6mgs.ampr.ab.ca instead of Info-Hams@ucsd.edu).

While rec.radio.amateur.space (and Ham-Space) is really the most appropriate target for these bulletins (based on their charters agreed to by a vote of the readership at the last newsgroup reorganization), in the interest of cooperation, we would be amenable to simultaneously cross-posting the AMSAT-related bulletins to rec.radio.info, r.r.a.space, *and* r.r.a.misc (as it's still only one article being propagated) if there is still a strong desire to relay these bulletins to their "traditional" mailing list (we realize that some of the conventions and procedures for relaying radio bulletins predate the rec.radio.info newsgroup and not everyone is going to adopt our recommended techniques overnight, if at all).

Mark and I would very much like to hear from individuals within AMSAT who are interested in using the net to publicize their organization and distribute their bulletins in the most invisible and bandwidth-efficient ways possible. An excellent forum for discussing some of these issues with Mark, myself, and about a dozen other experienced radio information maintainers on the Internet is the rec.radio.amateur Working Group mailing list (rra-wg). To subscribe, send E-mail to rra-wg-request@amdahl.com.

73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

Maintainer, Amateur Radio Elmers Resource Directory

751. Re: WANTED: E-mail address for info from amsat.org

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 20:23:31 UTC
From: pschleck@unomaha.edu
Message-ID: <2rof03$36s@hecate.umd.edu>
Source record: 27504
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

In article <2rods9$2v2@hecate.umd.edu>,
Paul W Schleck KD3FU <elmers-request@unomaha.edu, rra-wg@amdahl.com> wrote:

[...]

>
>Mark and I would very much like to hear from individuals within AMSAT
>who are interested in using the net to publicize their organization and
>distribute their bulletins in the most invisible and bandwidth-efficient
^^
>ways possible. An excellent forum for discussing some of these issues

[...]

Whoops! Freudian slip...

Of course I meant to say "most *visible*" :-)

73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

752. Element set accuracy / antenna's

Newsgroup: rec.radio.amateur.space
Date: 1994-05-22 21:24:40 UTC
From: mikel@alpha.ee.ufl.edu
Message-ID: <2roiioINNp2h@no-names.nerdc.ufl.edu>
Source record: 27506

Hi all:
I have a couple of quick questions, if someone can point me to a FAQ which covers them, or perhaps just drop an e-mail message. I have been trying to work the MIR space station and two things have come up. First I am running STSPLUS and have obtained several sets of satellite element sets, I have noticed that the different element sets give different! orbit projections!!!! What's up?, are the element sets only valid for a finite amount of time? How often should one get updated lists? Secondly, I'm using a 1/4 wave ground plane antenna with about 25 W from an IC-27A, I can hear MIR on occasion is there anyway to verify that MIR could hear me? It seems to always be busy, when(if) I get the opportunity to connect I'd like to be sure that MIR can hear me. Thanks in advance for any help you can provide.
Mike

753. Re: Element set accuracy / antenna's

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 07:57:43 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <2rpnlo$2o6@usenet.INS.CWRU.Edu>
Source record: 27507

Mir is big, has lots of drag and is in a low orbit. It would have re-entered and burned up years ago if it didn't fire its rockets ever month or three to reboost itself back up into its proper orbit. The reboosting seems to be done with a series of burns spread over days or even weeks. Of course, every time the rockets are fired, the orbit changes, thus invalidating your orbital elements!

Best bet for Mir - get elements weekly from packet or internet.

By the way, according to Jonathan's Space Report, Mir reboosted last week.

Dave, N9LTD

P.S. For a real thrill, run the keps for the various PARTS of Mir - Crystal, Kvant, etc. Notice how, according to the Keps, these objects are up to several minutes apart, despite the fact that they are all bolted together!
##

754. Re: Element set accuracy / antenna's

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 08:31:26 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994May23.083126.6157@ke4zv.atl.ga.us>
Source record: 27508

In article <2roiioINNp2h@no-names.nerdc.ufl.edu> mikel@alpha.ee.ufl.edu (Mike Lewis) writes:
>Hi all:
> I have a couple of quick questions, if someone can point me to a FAQ
>which covers them, or perhaps just drop an e-mail message. I have been
>trying to work the MIR space station and two things have come up. First
>I am running STSPLUS and have obtained several sets of satellite element
>sets, I have noticed that the different element sets give different! orbit
>projections!!!! What's up?, are the element sets only valid for a finite
>amount of time? How often should one get updated lists?

MIR (and Shuttle) make frequent orbit adjustments. So you need new orbital elements frequently for these two. Other satellite orbits change less often, and less drastically, so you don't need to update their elements quite so frequently. During a Shuttle mission, you'll likely want to update your orbital elements *daily*. For MIR, you don't have to update that often unless they are in the process of docking a supply freighter, or making an orbital adjustment. Every couple of weeks is sufficient when only atmospheric drag is affecting their orbit. Most other satellites will only change orbit due to atmospheric drag, and most other satellites are in higher orbits than MIR or Shuttle, so their orbits change less rapidly. You may need new orbital elements for them only every three months or so.

>Secondly, I'm using
>a 1/4 wave ground plane antenna with about 25 W from an IC-27A, I can hear
>MIR on occasion is there anyway to verify that MIR could hear me? It seems to
>always be busy, when(if) I get the opportunity to connect I'd like to be
>sure that MIR can hear me. Thanks in advance for any help you can provide.

The only way you can be sure MIR's packet robot hears you is if you get a connect. If you've allowed for doppler shift, and if your tones are at 3 kHz or less, 25 watts should be sufficient. However, a groundplane isn't an ideal antenna for this purpose. You'd do better with a Lindenblad or Quadrafilar Helix. Still, with the right geometry, you should be able to make a connect.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

755. Two-Line Orbital Element Sets (TLE399)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 13:19:33 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.769699173@afit.af.mil>
Source record: 27509

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #399 -
Alouette 1
1 00424U 62049 94133.01649331 .00000082 00000-0 86775-4 0 9906
2 00424 80.4634 319.7067 0022521 203.7629 156.2475 13.67809287577595
ATS 1
1 02608U 66110A 94128.96241248 -.00000236 00000-0 10000-3 0 8681
2 02608 14.5413 0.8185 0010221 37.3836 87.8175 1.00389538 17072
ATS 3
1 03029U 67111A 94138.63000442 -.00000113 00000-0 10000-3 0 1941
2 03029 14.6234 7.7737 0009564 267.7453 82.0688 1.00273173 97131
Cosmos 398
1 04966U 71016A 94140.15417356 .00072052 63931-5 15106-3 0 2194
2 04966 51.4568 79.6745 1048349 281.2344 67.3078 13.82843301768866
Starlette
1 07646U 75010A 94133.01260005 -.00000133 00000-0 60118-5 0 7773
2 07646 49.8271 292.1546 0206292 220.0300 138.5235 13.82186103972988
LAGEOS
1 08820U 76039A 94133.96853661 .00000019 00000-0 10000-3 0 9902
2 08820 109.8245 123.8827 0044284 292.5637 67.0192 6.38664301164964
ETS-2
1 09852U 77014A 94130.00000000 .00000112 00000-0 10000-3 0 9628
2 09852 12.0881 41.9435 0001849 28.7738 185.2316 1.00010025 9946
GOES 2
1 10061U 77048A 94136.45848873 .00000078 00000-0 00000+0 0 3262
2 10061 11.1419 46.1063 0001853 330.2693 247.5631 1.00256167 6798
IUE
1 10637U 78012A 94133.24474729 -.00000198 00000-0 10000-3 0 9964
2 10637 34.5628 95.4335 1313199 34.8115 139.6938 1.00278487 12374
GPS BI-01
1 10684U 78020A 94138.44795817 -.00000037 00000-0 10000-3 0 2691
2 10684 64.6266 46.3996 0062812 163.6499 196.5554 1.98069642104347
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GPS BI-02
1 10893U 78047A 94138.49564427 -.00000013 00000-0 10000-3 0 690
2 10893 63.5638 285.3880 0213879 13.8829 346.6979 2.01627380117472
GOES 3
1 10953U 78062A 94134.54083823 .00000078 00000-0 10000-3 0 2997
2 10953 10.0789 48.8789 0003701 85.4047 118.3901 1.00274902 11389
SeaSat 1
1 10967U 78064A 94133.89257308 -.00000021 00000-0 37800-4 0 2854
2 10967 107.9999 31.2595 0001847 276.2341 83.8590 14.37952928831431
GPS BI-03
1 11054U 78093A 94135.68999256 -.00000008 00000-0 10000-3 0 1797
2 11054 63.2541 282.7100 0043874 175.7842 184.2338 1.93505231113883
Nimbus 7
1 11080U 78098A 94136.20716417 -.00000036 00000-0 56505-5 0 3904
2 11080 99.0595 21.0286 0008481 215.2074 144.8520 13.83734065785655
GPS BI-04
1 11141U 78112A 94135.18238498 -.00000026 00000-0 00000+0 0 8809
2 11141 64.6259 47.6705 0048766 25.2422 335.0109 1.92894867 3142
GPS BI-05
1 11690U 80011A 94135.00344893 -.00000023 00000-0 10000-3 0 7819
2 11690 64.9531 48.2903 0141840 194.3751 165.1134 2.00555481118877
GPS BI-06
1 11783U 80032A 94132.60782710 -.00000025 00000-0 10000-3 0 9670
2 11783 62.6729 279.4117 0210011 29.2115 331.9263 2.03457414103236
GOES 5
1 12472U 81049A 94131.44237791 .00000085 00000-0 10000-3 0 7639
2 12472 6.7514 58.4664 0005672 355.0000 198.5783 1.00307145 5396
Cosmos 1383
1 13301U 82066A 94132.99818127 .00000062 00000-0 54956-4 0 2886
2 13301 82.9282 335.5592 0022663 191.0329 169.0333 13.68055146592614
LandSat 4
1 13367U 82072A 94134.13957450 .00000093 00000-0 30777-4 0 4843
2 13367 98.1797 193.2872 0007475 8.1268 352.0050 14.57121484629103
IRAS
1 13777U 83004A 94133.01907203 -.00000054 00000-0 -71463-5 0 5917
2 13777 98.9740 324.7080 0013396 55.5815 304.6619 13.99196224246220
Cosmos 1447
1 13916U 83021A 94134.19513796 .00000044 00000-0 30074-4 0 3895
2 13916 82.9445 36.8393 0038925 121.9063 238.5888 13.74308871558669
TDRS 1
1 13969U 83026B 94139.68716035 -.00000191 00000-0 10000-4 0 3046
2 13969 7.6496 51.3998 0004598 64.4131 93.8563 1.00267527 13763
GOES 6
1 14050U 83041A 94137.26938677 -.00000064 00000-0 10000-3 0 2020
2 14050 5.5637 61.3632 0005391 330.9656 191.2406 1.00217203 12472
OSCAR 10
1 14129U 83058B 94135.65640866 -.00000151 00000-0 10000-3 0 2786
2 14129 27.1386 327.4455 6021198 178.4592 184.9623 2.05881022 54144
LandSat 5
1 14780U 84021A 94138.77825810 .00000000 00000-0 10000-4 0 770
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2 14780 98.1629 199.1251 0004989 10.4031 349.7184 14.57129189543199
UoSat 2
1 14781U 84021B 94134.04076705 .00000201 00000-0 41983-4 0 6883
2 14781 97.7881 150.3647 0012686 24.2878 335.8924 14.69205908545296
GPS BI-09
1 15039U 84059A 94136.82283795 -.00000035 00000-0 10000-4 0 1997
2 15039 63.8966 42.0093 0055097 214.5986 145.0760 2.00558394 72713
Cosmos 1574
1 15055U 84062A 94133.90871833 .00000041 00000-0 28398-4 0 5888
2 15055 82.9538 90.3291 0027014 315.6504 44.2477 13.73605385495923
GPS BI-10
1 15271U 84097A 94139.22996932 -.00000023 00000-0 10000-3 0 8047
2 15271 62.3722 279.2468 0145327 349.0356 10.6368 2.00580462 70020
Cosmos 1602
1 15331U 84105A 94133.99623307 .00000411 00000-0 45918-4 0 2800
2 15331 82.5320 109.7412 0019643 322.0808 37.9021 14.84393995519445
NOAA 9
1 15427U 84123A 94135.11734660 .00000108 00000-0 81386-4 0 8108
2 15427 99.0565 185.2161 0014517 316.3805 43.6219 14.13614434485679
GPS BI-11
1 16129U 85093A 94133.02681012 -.00000038 00000-0 00000+0 0 5902
2 16129 63.7139 44.1112 0202757 241.5401 72.5072 1.92717110 62913
Mir
1 16609U 86017A 94139.87954077 .00027705 00000-0 39399-3 0 6137
2 16609 51.6468 327.9164 0001412 325.9678 34.1223 15.56155327471630
SPOT 1
1 16613U 86019A 94137.27929496 .00000089 00000-0 62356-4 0 6791
2 16613 98.6928 211.4631 0001885 7.9783 352.1422 14.20054251112170
Cosmos 1766
1 16881U 86055A 94136.52378825 .00000345 00000-0 39062-4 0 1966
2 16881 82.5206 165.3950 0019295 337.9579 22.0804 14.83426924420765
EGP
1 16908U 86061A 94134.18543759 -.00000097 00000-0 00000+0 0 8858
2 16908 50.0097 188.9352 0011718 223.6505 136.3403 12.44409748 21156
NOAA 10
1 16969U 86073A 94125.88441476 .00000029 00000-0 30372-4 0 7075
2 16969 98.5081 136.1764 0014034 90.8018 269.4770 14.24882212396580
MOS-1
1 17527U 87018A 94135.20419600 .00000091 00000-0 99794-4 0 690
2 17527 99.0338 204.5824 0001574 34.4475 325.6783 13.94905462368346
GOES 7
1 17561U 87022A 94136.55950118 -.00000046 00000-0 10000-3 0 8406
2 17561 1.4878 76.0896 0004834 345.9521 261.4994 1.00277195 9651
Kvant-1
1 17845U 87030A 94139.94371428 .00012295 00000-0 17913-3 0 8562
2 17845 51.6483 327.5970 0001072 303.8599 55.9653 15.56134936471710
DMSP B5D2-3
1 18123U 87053A 94125.87800314 .00000020 00000-0 32686-4 0 4828
2 18123 98.7888 318.2085 0013757 305.1528 54.8362 14.15353289355023
RS-10/11
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1 18129U 87054A 94134.60454005 .00000043 00000-0 30226-4 0 8971
2 18129 82.9259 353.6714 0012816 112.1233 248.1285 13.72336655345304
Meteor 2-16
1 18312U 87068A 94136.34898320 .00000058 00000-0 38483-4 0 2866
2 18312 82.5552 237.1006 0011536 195.6451 164.4352 13.84029550340650
Meteor 2-17
1 18820U 88005A 94133.98858706 .00000049 00000-0 30113-4 0 2865
2 18820 82.5387 295.7888 0015355 279.6676 80.2746 13.84715069317623
DMSP B5D2-4
1 18822U 88006A 94136.56088281 .00000068 00000-0 48901-4 0 5877
2 18822 98.4439 352.8346 0007720 75.7577 284.4462 14.22949584326026
Glonass 34
1 19163U 88043A 94127.12508055 .00000062 00000-0 10000-3 0 8858
2 19163 65.0220 111.8233 0007343 167.8715 192.1412 2.13102353 45782
Glonass 36
1 19165U 88043C 94135.15829455 .00000070 00000-0 10000-3 0 2798
2 19165 65.0030 111.5096 0003012 321.3394 38.6216 2.13102226 46579
METEOSAT 3
1 19215U 88051A 94136.86610799 -.00000253 00000-0 10000-3 0 9028
2 19215 1.6690 72.5964 0000673 353.1907 46.0574 1.00278548 9605
AO-13
1 19216U 88051B 94136.30336565 -.00000444 00000-0 10000-4 0 9128
2 19216 57.8496 252.4327 7207599 341.6930 2.0395 2.09724363 13841
OKEAN 1
1 19274U 88056A 94134.85443080 .00000304 00000-0 35087-4 0 8963
2 19274 82.5116 266.8382 0021182 115.9099 244.4300 14.82165004316144
Meteor 3-2
1 19336U 88064A 94134.65926681 .00000051 00000-0 10000-3 0 2838
2 19336 82.5410 347.4141 0017746 351.2716 8.8074 13.16967024278843
Glonass 39
1 19503U 88085C 94135.65335458 -.00000034 00000-0 10000-3 0 1790
2 19503 65.7306 350.4299 0007132 170.7114 189.3208 2.13102553 44071
NOAA 11
1 19531U 88089A 94136.20592678 .00000106 00000-0 82016-4 0 6281
2 19531 99.1704 124.3366 0010859 221.3105 138.7246 14.12985134290700
TDRS 2
1 19548U 88 91 B 94136.69016087 -.00000261 00000-0 99999-4 0 8069
2 19548 0.9470 77.7104 0001738 341.4669 1.6749 1.00278766 7895
Glonass 40
1 19749U 89001A 94130.06162703 .00000042 00000-0 10000-3 0 3882
2 19749 64.9654 111.2985 0007013 261.2616 98.6415 2.13101384 41469
Glonass 41
1 19750U 89001B 94133.87227005 .00000058 00000-0 10000-3 0 2823
2 19750 64.9862 111.2340 0005345 251.1693 108.7710 2.13101890 41560
GPS BII-01
1 19802U 89 13 A 94137.31120632 .00000012 00000-0 99999-4 0 8084
2 19802 55.1052 140.9336 0031692 179.9447 180.0836 2.00548400 38435
Akebono
1 19822U 89016A 94140.16247653 .00009272 00000-0 48303-3 0 2666
2 19822 75.1092 198.3541 3822894 311.4362 21.5015 7.77938065107111
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Meteor 2-18
1 19851U 89018A 94133.02378206 .00000061 00000-0 41858-4 0 2842
2 19851 82.5206 171.9545 0014011 333.0989 26.9445 13.84364458262829
MOP-1
1 19876U 89020B 94125.44136900 -.00000082 00000-0 00000+0 0 247
2 19876 0.3683 61.6465 0001098 15.4286 296.4680 1.00273917 6646
TDRS 3
1 19883U 89021B 94136.58155210 -.00000264 00000-0 00000+0 0 9160
2 19883 0.0980 73.8580 0000880 289.4436 39.1596 1.00269530 89153
GPS BII-02
1 20061U 89044A 94132.67178087 -.00000060 00000-0 10000-3 0 9202
2 20061 54.6765 317.8990 0127975 207.8945 151.4145 2.00565503 36081
Nadezhda 1
1 20103U 89050A 94134.94401820 .00000071 00000-0 59026-4 0 9889
2 20103 82.9555 312.2739 0038981 23.8439 336.4514 13.73838645243741
GPS BII-03
1 20185U 89064A 94138.49146837 .00000100 00000-0 00000+0 0 9158
2 20185 54.9303 141.5210 0010144 267.7659 92.1342 2.00573936 34775
GMS 4
1 20217U 89070A 94138.10767061 -.00000283 00000-0 10000-3 0 112
2 20217 0.1996 65.6769 0001109 46.9118 301.8110 1.00264833 17793
GPS BII-04
1 20302U 89085A 94134.53655963 -.00000021 00000-0 00000+0 0 9195
2 20302 53.5876 258.1364 0001960 230.2477 129.7713 2.00564673 33495
Meteor 3-3
1 20305U 89086A 94136.86006307 .00000044 00000-0 10000-3 0 458
2 20305 82.5500 291.6361 0006810 17.9875 342.1475 13.04407836218814
COBE
1 20322U 89089A 94134.55401864 -.00000015 00000-0 18470-4 0 34
2 20322 98.9767 151.1364 0009063 8.9461 351.1858 14.03431446229671
Kvant-2
1 20335U 89093A 94139.94371428 .00012295 00000-0 17913-3 0 9269
2 20335 51.6483 327.5970 0001072 303.8599 55.9653 15.56134936471639
GPS BII-05
1 20361U 89097A 94134.54480420 .00000011 00000-0 10000-3 0 7942
2 20361 55.5121 83.6227 0071003 108.2230 252.5273 2.00559823 22978
SPOT 2
1 20436U 90005A 94134.85333559 .00000095 00000-0 65161-4 0 7862
2 20436 98.7182 209.7821 0001085 30.4807 329.6434 14.20030086223368
UO-14
1 20437U 90005B 94134.77578158 .00000049 00000-0 36012-4 0 9886
2 20437 98.5905 220.0041 0010362 293.1621 66.8470 14.29842002224819
UO-15
1 20438U 90005C 94134.76642653 .00000005 00000-0 19197-4 0 7883
2 20438 98.5899 219.0074 0009495 297.3573 62.6642 14.29174781224731
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1 20439U 90005D 94132.73338135 .00000023 00000-0 25875-4 0 7875
2 20439 98.5990 219.1851 0010892 301.2386 58.7720 14.29895379224532
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1 20440U 90005E 94136.25955384 .00000042 00000-0 33414-4 0 7878
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2 20440 98.5998 222.9797 0010729 288.2946 71.7069 14.30035495225054
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2 20441 98.5998 221.5067 0011130 292.6568 67.3433 14.30009656224848
LO-19
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2 20442 98.5992 221.1823 0011669 294.7102 65.2867 14.30105216224772
GPS BII-06
1 20452U 90008A 94139.43096026 .00000043 00000-0 10000-3 0 9087
2 20452 54.0424 197.6909 0053257 74.9039 285.7461 2.00548811 31577
MOS-1B
1 20478U 90013A 94137.18603645 .00000091 00000-0 10000-3 0 6262
2 20478 99.0384 210.6573 0001689 81.1386 278.9967 13.94905575138324
DEBUT
1 20479U 90013B 94136.42821927 -.00000032 00000-0 -41476-5 0 7849
2 20479 99.0321 294.3621 0541243 51.1932 313.6224 12.83318901200060
FO-20
1 20480U 90013C 94133.90960643 -.00000042 00000-0 -27161-4 0 6833
2 20480 99.0321 292.2171 0541449 57.0939 308.1058 12.83225410199736
MOS-1B R/B
1 20491U 90013D 94133.58913140 -.00000702 00000-0 -12535-2 0 9999
2 20491 99.0262 336.1134 0469809 288.8689 66.2041 13.02978037202151
LACE
1 20496U 90015A 94132.93339111 .00002114 00000-0 73657-4 0 3999
2 20496 43.1018 249.1290 0009919 141.3513 218.8054 15.32950334236119
Nadezhda 2
1 20508U 90017A 94133.85613686 -.00000002 00000-0 -17545-4 0 9894
2 20508 82.9511 87.7337 0044739 338.2027 21.7230 13.73474401210833
OKEAN 2
1 20510U 90018A 94134.67898251 .00000270 00000-0 33933-4 0 2978
2 20510 82.5247 215.9624 0017904 304.7309 55.2221 14.78323917226714
INTELSAT-6
1 20523U 90021A 94132.49520166 -.00000237 00000-0 10000-3 0 4101
2 20523 0.0086 349.9013 0000139 261.3112 122.5416 1.00267920 8259
GPS BII-07
1 20533U 90025A 94136.84723687 -.00000041 00000-0 10000-3 0 9021
2 20533 55.0138 318.2253 0044935 81.9092 278.6075 2.00572614 30291
PegSat
1 20546U 90028A 94133.90109779 .00007327 00000-0 17376-3 0 6272
2 20546 94.1194 278.6504 0077363 67.1400 293.7972 15.38640940226990
HST
1 20580U 90037B 94137.15152929 .00000554 00000-0 40130-4 0 4836
2 20580 28.4681 75.3297 0006448 124.3383 235.7814 14.90601190 24754
MACSAT 2
1 20608U 90043B 94136.57116420 .00000245 00000-0 39746-4 0 9872
2 20608 89.9279 179.8949 0104394 200.7619 158.9353 14.64703871214658
Glonass 44
1 20619U 90045A 94139.34703412 -.00000025 00000-0 00000+0 0 758
2 20619 65.3527 349.9286 0023167 210.8895 149.0207 2.13102686 31119
Glonass 45
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Glonass 46
1 20621U 90045C 94135.77633584 -.00000035 00000-0 10000-3 0 6983
2 20621 65.3503 350.0765 0013105 195.4455 164.5623 2.13101412 31077
Kristall
1 20635U 90048A 94139.94371428 .00012295 00000-0 17913-3 0 7194
2 20635 51.6483 327.5970 0001072 303.8599 55.9653 15.56134936471609
ROSAT
1 20638U 90049A 94136.36928835 .00000246 00000-0 35348-4 0 2945
2 20638 52.9893 132.9136 0010996 337.5602 22.4904 15.06813984217289
Meteor 2-19
1 20670U 90057A 94134.76373028 .00000024 00000-0 79036-5 0 7874
2 20670 82.5458 235.0081 0014360 239.3957 120.5785 13.84187934195999
CRRES
1 20712U 90065A 94137.37684807 .00000204 00000-0 45428-3 0 9070
2 20712 17.6700 200.5486 7179653 166.2051 235.8423 2.35149227 25165
GPS BII-08
1 20724U 90068A 94136.66977957 .00000084 00000-0 10000-3 0 7902
2 20724 54.7429 139.2588 0109200 161.6670 198.7486 2.00561806 27711
Feng Yun1-2
1 20788U 90081A 94136.55798805 .00000424 00000-0 30916-3 0 9658
2 20788 98.8364 157.6984 0016484 95.2584 265.0463 14.01334974189270
Meteor 2-20
1 20826U 90086A 94132.58504276 .00000049 00000-0 31273-4 0 7954
2 20826 82.5258 174.3059 0014158 141.2539 218.9638 13.83580685182839
GPS BII-09
1 20830U 90088A 94137.72148470 .00000016 00000-0 10000-3 0 7972
2 20830 55.4510 81.5318 0065777 105.0697 255.6444 2.00560899 26817
GPS BIIA-10
1 20959U 90103A 94131.13955504 .00000063 00000-0 10000-3 0 7001
2 20959 54.9578 141.3815 0084431 225.7765 133.5640 2.00566431 25277
DMSP B5D2-5
1 20978U 90105A 94136.52194280 .00000184 00000-0 82070-4 0 7144
2 20978 98.6895 200.0071 0078147 257.7953 101.4470 14.32417054180577
Glonass 47
1 21006U 90110A 94136.27499192 .00000078 00000-0 00000+0 0 6548
2 21006 64.9460 110.4538 0059556 188.3637 171.5232 2.13102599 26751
Glonass 48
1 21007U 90110B 94134.58355697 .00000064 00000-0 00000+0 0 7616
2 21007 64.9631 110.5831 0035619 183.0432 176.9056 2.13101299 26713
Glonass 49
1 21008U 90110C 94135.40933830 .00000071 00000-0 00000+0 0 7641
2 21008 64.9482 110.5080 0010885 282.5445 77.3342 2.13099418 26712
AO-21
1 21087U 91006A 94136.51415561 .00000094 00000-0 82657-4 0 4647
2 21087 82.9441 166.1517 0035247 169.4328 190.7577 13.74539324165233
RS-12/13
1 21089U 91007A 94133.21181356 .00000023 00000-0 89011-5 0 6866
2 21089 82.9238 37.3882 0028156 203.8370 156.1477 13.74040087163847
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1 21140U 91015B 94133.43423318 -.00000003 00000-0 00000+0 0 7072
2 21140 0.2619 18.9562 0002430 57.8332 310.2644 1.00281832 900
Nadezhda 3
1 21152U 91019A 94135.58236927 .00000054 00000-0 41853-4 0 7863
2 21152 82.9255 351.3696 0041165 308.5988 51.1487 13.73501706158918
Glonass 50
1 21216U 91025A 94135.82375584 -.00000035 00000-0 10000-3 0 2900
2 21216 65.0983 349.8249 0009062 208.2607 151.7455 2.13103367 24253
Glonass 51
1 21217U 91025B 94137.29738041 -.00000031 00000-0 00000+0 0 6720
2 21217 65.0840 349.7817 0009439 234.4511 125.5036 2.13101754 24273
Glonass 52
1 21218U 91025C 94138.35029852 -.00000028 00000-0 10000-3 0 1942
2 21218 65.0705 349.7232 0007390 309.8067 50.1912 2.13102733 24300
GRO
1 21225U 91027B 94132.78355012 .00002428 00000-0 51424-4 0 910
2 21225 28.4611 117.8794 0003807 168.2185 191.8514 15.40771764 51470
Meteor 3-4
1 21232U 91030A 94133.58950241 .00000050 00000-0 10000-3 0 6937
2 21232 82.5414 194.0495 0011485 273.4571 86.5244 13.16462067146800
NOAA 12
1 21263U 91032A 94136.46935316 .00000163 00000-0 92707-4 0 348
2 21263 98.6184 164.9422 0012780 334.1017 25.9523 14.22404550156024
OKEAN 3
1 21397U 91039A 94133.92419078 .00000248 00000-0 32466-4 0 9982
2 21397 82.5241 128.4797 0023490 16.3408 343.8564 14.76201507158453
GPS BIIA-11
1 21552U 91047A 94134.40343908 .00000003 00000-0 10000-3 0 7072
2 21552 55.7422 79.2161 0056373 237.7679 121.6632 2.00564210 20938
ERS-1
1 21574U 91050A 94139.19912488 .00000017 00000-0 20936-4 0 4483
2 21574 98.5031 214.1195 0001269 52.8904 307.2398 14.35945556148547
UO-22
1 21575U 91050B 94134.22431410 .00000058 00000-0 34175-4 0 4906
2 21575 98.4367 209.4047 0008606 36.3601 323.8167 14.36913183148208
ORBCOMM-X
1 21576U 91050C 94132.68318457 .00000098 00000-0 48174-4 0 5875
2 21576 98.4362 206.7723 0004961 49.5228 310.6366 14.36309149147919
TUBSAT-A
1 21577U 91050D 94135.70632862 .00000039 00000-0 27887-4 0 4873
2 21577 98.4340 210.1672 0007367 37.2032 322.9646 14.36439038148377
SARA
1 21578U 91050E 94134.23693064 .00000389 00000-0 14086-3 0 6845
2 21578 98.4478 211.8693 0005922 46.2923 313.8756 14.38763423148321
TDRS 4
1 21639U 91054B 94138.43143707 .00000085 00000-0 10000-3 0 7304
2 21639 0.0664 29.5788 0004260 77.9258 109.4360 1.00276026 8272
Meteor 3-5
1 21655U 91056A 94134.01812282 .00000051 00000-0 10000-3 0 7027
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2 21655 82.5508 140.8780 0011738 291.9740 68.0115 13.16829949131962
UARS
1 21701U 91063B 94132.90841328 .00002827 00000-0 26761-3 0 5174
2 21701 56.9866 300.4430 0005491 94.2247 265.9415 14.96527573145656
DMSP B5D2-6
1 21798U 91082A 94125.69893379 .00000134 00000-0 94448-4 0 3638
2 21798 98.9641 131.4537 0011800 260.5448 99.4388 14.13792830125613
Glonass 53
1 21853U 92005A 94135.27780498 .00000070 00000-0 10000-3 0 8891
2 21853 64.9010 110.2074 0008345 192.2902 167.6693 2.13102387 17846
Glonass 54
1 21854U 92005B 94136.03925792 .00000076 00000-0 00000+0 0 9583
2 21854 64.8996 110.1734 0016893 9.0327 350.9676 2.13103606 17847
Glonass 55
1 21855U 92005C 94134.69263882 .00000064 00000-0 00000+0 0 9610
2 21855 64.8969 110.2207 0007503 220.8122 139.1116 2.13102208 17807
JERS-1
1 21867U 92007A 94135.43528142 .00002139 00000-0 18270-3 0 3050
2 21867 97.6472 210.8874 0002884 81.4756 278.6793 14.98709355123474
GPS BIIA-12
1 21890U 92009A 94133.86696692 -.00000021 00000-0 10000-3 0 5075
2 21890 54.1420 258.1767 0057659 165.7045 194.4570 2.00571481 16290
GPS BIIA-13
1 21930U 92 19 A 94137.06847540 -.00000028 00000-0 99999-4 0 4067
2 21930 55.5944 19.0761 0051699 167.9812 192.1877 2.00564559 15284
EUVE
1 21987U 92031A 94136.40565076 .00001568 00000-0 64379-4 0 2949
2 21987 28.4350 267.0128 0009693 350.8318 9.2131 15.18509428107560
SAMPEX
1 22012U 92038A 94136.21068837 .00000973 00000-0 83174-4 0 5146
2 22012 81.6718 204.5963 0120579 143.2115 217.7457 14.90996494101516
GPS BIIA-14
1 22014U 92039A 94136.60137511 .00000031 00000-0 10000-3 0 4015
2 22014 54.9339 199.0001 0067773 304.7288 54.6600 2.00564463 7116
Glonass 56
1 22056U 92047A 94138.81666635 -.00000028 00000-0 00000+0 0 8699
2 22056 64.9212 349.9235 0003736 285.1120 74.8897 2.13102950 13981
Glonass 57
1 22057U 92047B 94133.94895539 -.00000039 00000-0 00000+0 0 8632
2 22057 64.9372 350.1107 0007449 331.4010 28.6037 2.13102724 13857
Glonass 58
1 22058U 92047C 94136.23605584 -.00000034 00000-0 00000+0 0 8799
2 22058 64.9482 350.0404 0008923 282.6609 77.2976 2.13103914 13953
TOPEX
1 22076U 92052A 94135.55985472 -.00000038 00000-0 10000-3 0 7569
2 22076 66.0467 358.7734 0007529 266.3496 93.6664 12.80931516 82318
KO-23
1 22077U 92052B 94134.65134563 -.00000037 00000-0 10000-3 0 3854
2 22077 66.0866 350.2005 0013609 297.5548 62.4086 12.86285709 82471
S80/T
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1 22078U 92052C 94134.66664696 -.00000037 00000-0 10000-3 0 3839
2 22078 66.0869 349.4886 0015018 297.1350 62.8130 12.86567710 82542
GPS BIIA-15
1 22108U 92058A 94135.57138400 -.00000020 00000-0 10000-3 0 3987
2 22108 54.3316 258.8164 0116932 134.4312 226.5866 2.00553196 12279
FREJA
1 22161U 92064A 94131.14970403 .00000057 00000-0 74143-4 0 3965
2 22161 63.0073 26.3890 0782601 311.9320 41.7458 13.21759174 76905
LAGEOS II
1 22195U 92070B 94136.31726938 -.00000009 00000-0 10000-3 0 2884
2 22195 52.6385 113.8154 0138932 103.4824 258.1258 6.47294161 36887
GPS BIIA-16
1 22231U 92079A 94138.25193339 .00000032 00000-0 10000-3 0 4036
2 22231 54.7159 200.1777 0031615 305.5403 54.0621 2.00557236 10901
GPS BIIA-17
1 22275U 92089A 94138.39477493 .00000037 00000-0 10000-3 0 4097
2 22275 54.6622 197.7055 0052865 256.3425 103.1201 2.00561475 10315
TDRS 5
1 22314U 93003B 94139.15797001 -.00000278 00000-0 10000-3 0 3977
2 22314 1.0422 72.5851 0003226 333.9275 200.8207 1.00261088 5039
GPS BIIA-18
1 22446U 93007A 94137.46925630 -.00000041 00000-0 10000-3 0 4003
2 22446 54.7147 318.5321 0076621 346.8930 12.8152 2.00573180 9280
Glonass 59
1 22512U 93010A 94135.27860841 .00000070 00000-0 00000+0 0 5692
2 22512 64.9043 110.0532 0008939 211.8087 148.1007 2.13102329 9416
Glonass 60
1 22513U 93010B 94138.97298728 .00000083 00000-0 00000+0 0 5887
2 22513 64.9015 109.9439 0007381 213.6704 146.2726 2.13102757 9686
Glonass 61
1 22514U 93010C 94140.14749293 .00000075 00000-0 00000+0 0 5755
2 22514 64.9154 109.8858 0013254 199.1556 160.7695 2.13101575 9711
ASTRO-D
1 22521U 93011A 94132.99807151 .00001140 00000-0 93480-4 0 2868
2 22521 31.1032 296.9616 0075877 108.9096 251.9784 14.93180812 66836
UFO F1
1 22563U 93015A 94133.86969059 .00000011 00000-0 10000-3 0 2829
2 22563 26.7085 300.2843 0001798 7.5357 269.4068 0.99250365 8495
GPS BIIA-19
1 22581U 93 17 A 94136.61159044 -.00000028 00000-0 99999-4 0 2040
2 22581 55.0949 18.8523 0048164 34.2549 326.1013 2.00568483 8324
ARSENE
1 22654U 93031B 94124.94294243 -.00000120 00000-0 00000+0 0 2516
2 22654 1.7729 101.4452 2921942 180.0752 180.1868 1.42202361 582
GPS BIIA-20
1 22657U 93032A 94135.25167837 -.00000063 00000-0 10000-3 0 3022
2 22657 55.1300 18.6976 0060120 205.9645 153.7869 2.00557431 3622
RADCAL
1 22698U 93041A 94133.48783084 .00000072 00000-0 26641-4 0 2913
2 22698 89.5455 311.1850 0090050 301.8187 57.4244 14.21309450 45662
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GPS BIIA-21
1 22700U 93042A 94139.20030362 -.00000036 00000-0 10000-3 0 2943
2 22700 54.5366 259.3766 0027155 319.7364 37.7985 2.00552402 6503
NOAA 13
1 22739U 93050A 94134.24775773 .00000123 00000-0 93467-4 0 4346
2 22739 98.9438 78.7751 0009209 213.5097 146.5494 14.10895671 39173
GPS BIIA-22
1 22779U 93054A 94137.30049108 -.00000041 00000-0 10000-3 0 3238
2 22779 54.8113 318.4937 0022331 228.9650 130.8600 2.00570518 5224
Meteor 2-21
1 22782U 93055A 94132.77291839 .00000056 00000-0 37429-4 0 2957
2 22782 82.5480 234.4911 0022126 329.5225 30.4648 13.83005585 35196
UFO F2
1 22787U 93056A 94134.64341309 -.00000073 00000-0 10000-3 0 2741
2 22787 4.8606 323.4363 0004458 22.5326 190.1893 1.00275041 918
SPOT 3
1 22823U 93061A 94139.68546920 .00000169 00000-0 10000-3 0 3097
2 22823 98.7144 214.5979 0000869 69.2267 290.8997 14.20033571 33448
STELLA
1 22824U 93061B 94135.72839822 -.00000015 00000-0 11947-4 0 2840
2 22824 98.6562 211.7640 0005915 311.8032 48.2640 14.27096761 33042
AO-27
1 22825U 93061C 94134.73495974 .00000033 00000-0 31405-4 0 2847
2 22825 98.6556 210.8764 0008618 313.7678 46.2786 14.27622306 32917
IO-26
1 22826U 93061D 94134.22782802 .00000105 00000-0 60241-4 0 2841
2 22826 98.6556 210.4081 0008900 317.7860 42.2636 14.27726245 32846
HEATHSAT
1 22827U 93061E 94133.15992482 .00000044 00000-0 35671-4 0 3460
2 22827 98.6538 209.3230 0008821 305.7656 54.2723 14.27834950 32698
PO-28
1 22829U 93061G 94133.19963416 .00000044 00000-0 35350-4 0 2778
2 22829 98.6517 209.4085 0009569 304.5811 55.4472 14.28023395 32706
KO-25
1 22830U 93061H 94134.17599451 .00000078 00000-0 48923-4 0 2893
2 22830 98.5539 207.9656 0010519 278.3913 81.6093 14.28052000 32846
GPS BIIA-23
1 22877U 93068A 94139.34819485 .00000003 00000-0 10000-3 0 1203
2 22877 55.1880 79.6004 0033133 287.7012 71.9209 2.00577596 4150
METEOSAT 6
1 22912U 93073B 94134.99581615 -.00000081 00000-0 00000+0 0 791
2 22912 0.9575 267.2503 0001636 200.4424 113.2759 1.00273307 192
HST Array
1 22920U 90037C 94136.92283045 .00006847 00000-0 57412-3 0 1359
2 22920 28.4695 69.3601 0003417 282.9504 77.0892 14.96560265 24802
Soyuz TM-18
1 22957U 94001A 94139.94371428 .00012295 00000-0 17913-3 0 1280
2 22957 51.6483 327.5970 0001072 303.8599 55.9653 15.56134936 20563
Meteor 3-6
1 22969U 94003A 94133.89176246 .00000085 00000-0 18999-3 0 574
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2 22969 82.5592 80.4551 0016158 355.7798 4.3197 13.16720904 14337
TUBSAT-B
1 22970U 94003B 94133.35141976 .00000144 00000-0 34369-3 0 462
2 22970 82.5560 80.8171 0016594 355.6954 4.4030 13.16821323 14269
1994004C
1 22987U 94004C 94098.46584220 -.00000666 00000-0 00000+0 0 74
2 22987 66.5360 59.3960 9045772 202.2990 31.7820 0.46869300 14
ODERACS A
1 22990U 94006B 94139.29878500 .00072133 12112-4 29216-3 0 784
2 22990 56.9778 99.6847 0022784 103.0206 257.3397 15.86174082 15581
ODERACS B
1 22991U 94006C 94139.26238348 .00072825 12125-4 30210-3 0 780
2 22991 56.9862 100.1394 0021275 95.6520 264.6975 15.85732769 15573
ODERACS E
1 22994U 94006F 94138.31483586 .00035634 00000-0 19179-3 0 686
2 22994 56.9815 106.4925 0021426 100.8423 260.1615 15.79626130 15391
ODERACS F
1 22995U 94006G 94137.87311006 .00038122 00000-0 20461-3 0 797
2 22995 56.9805 108.5188 0021189 96.9678 263.3802 15.79661485 15326
BREMSAT
1 22998U 94006H 94139.90012357 .00037182 00000-0 20713-3 0 653
2 22998 56.9859 100.0262 0017527 107.8822 252.4160 15.78959152 15485
GPS BIIA-24
1 23027U 94 16 A 94136.93068860 -.00000028 00000-0 00000+0 0 22
2 23027 54.9502 20.7502 0062437 190.8046 169.1081 2.00556861 1412
SEDS 2
1 23028U 94016B 94128.53971118 .13369896 -21752-5 25228-3 0 906
2 23028 32.3548 293.3548 0005633 117.2655 243.1962 16.47311643 9439
ProgressM22
1 23035U 94019A 94139.94371428 .00012295 00000-0 17913-3 0 714
2 23035 51.6483 327.5970 0001072 303.8599 55.9653 15.56134936 9186
GOES 8
1 23051U 94022A 94137.21121259 -.00000177 00000-0 00000+0 0 968
2 23051 0.4228 268.1453 0035241 45.8914 265.5898 1.00284440 112
Cosmos 2278
1 23087U 94023A 94136.56354735 .00000166 00000-0 11628-3 0 130
2 23087 71.0019 329.7399 0005107 10.9067 349.2162 14.12139860 3283
1994023B
1 23088U 94023B 94133.98941137 -.00000157 00000-0 -57806-4 0 177
2 23088 71.0033 334.9984 0004997 280.2180 79.8380 14.13776697 2937
1994023C
1 23089U 94023C 94127.62274396 .00000060 00000-0 96918-4 0 110
2 23089 71.0291 350.6745 0200905 76.9326 285.4084 13.71649198 1981
1994023D
1 23090U 94023D 94132.99831375 .00000149 00000-0 18076-3 0 86
2 23090 71.0320 340.1835 0193349 44.7907 316.8627 13.73118704 2733
1994023E
1 23091U 94023E 94136.60094967 -.00000023 00000-0 17683-4 0 94
2 23091 70.9876 332.5815 0201481 63.3571 298.8070 13.71153139 3216
Cosmos 2279
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1 23092U 94024A 94139.80236271 .00000023 00000-0 82686-5 0 182
2 23092 82.9467 257.9743 0034422 221.8933 137.9589 13.74972695 3260
1994024B
1 23093U 94024B 94139.85040146 .00001142 00000-0 11512-2 0 340
2 23093 82.9376 257.8976 0025422 220.0903 139.9158 13.76405693471191
1994023F
1 23094U 94023F 94139.58340324 -.00001125 00000-0 -10329-2 0 259
2 23094 70.9917 326.7759 0206157 31.7850 329.5750 13.71590433 3625
Cosmos 2280
1 23095U 94025A 94140.36402922 .00161720 15326-4 20582-3 0 499
2 23095 70.3782 95.4043 0037998 69.1579 291.3667 16.05695409 3479
SROSS C2
1 23099U 94027A 94135.22269126 -.00000775 00000-0 -36027-4 0 261
2 23099 46.0479 81.8438 0345274 229.2590 127.7815 14.65254217 1640
1994027B
1 23100U 94027B 94133.93039175 .00000838 00000-0 85217-4 0 82
2 23100 46.0396 88.1665 0345560 223.0201 134.3150 14.64705651 1493
1994028A
1 23101U 94028A 94136.06795596 .00006420 00000-0 13259-3 0 154
2 23101 97.1185 330.8607 0011005 260.2687 99.7311 15.46121339 1089
1994028B
1 23102U 94028B 94138.50623748 .00049428 00000-0 71471-3 0 194
2 23102 96.8394 333.0345 0075935 191.9826 167.9688 15.52381572 1460
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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756. Re: amsat mailing list

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 14:31:37 UTC
From: pete@wybbs.mi.org
Message-ID: <Cq9F0q.6ws@wybbs.mi.org>
Source record: 27424

Yeah, AMSAT is very slow on their mailing list. When I wrote requesting info,
it took a long time to get it. Be patient, I guess.
--
-=-
Pete Hoffswell |N9SSA |Internet: pete@wybbs.mi.org
Holland, Michigan |616-395-5551 | Packet: n9ssa@wa8ure.#swmi.mi.usa.na
-=-

757. looking for 2m all mode for sat work

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 15:09:16 UTC
From: lent@anagram.mcs.anl.gov
Message-ID: <76970575625367@anagram.mcs.anl.gov>
Source record: 27510

I am looking to get into amateur satilitte radio.
Could someone describe a basic setup?
I am also looking for a 2m allmode for repeater work and as a first sat radio.
thanks alot
73
kc4zqg,
send replies to lent@mcs.anl.gov
h-708-257-0675
w-708-252-6815

758. Re: Element set accuracy / antenna's

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 16:12:31 UTC
From: little@iamu.chi.dec.com
Message-ID: <1994May23.161231.11168@nntpd2.cxo.dec.com>
Source record: 27411

In article <2roiioINNp2h@no-names.nerdc.ufl.edu>, mikel@alpha.ee.ufl.edu (Mike Lewis) writes:
|>Hi all:
|> I have a couple of quick questions, if someone can point me to a FAQ
|>which covers them, or perhaps just drop an e-mail message. I have been
|>trying to work the MIR space station and two things have come up. First
|>I am running STSPLUS and have obtained several sets of satellite element
|>sets, I have noticed that the different element sets give different! orbit
|>projections!!!! What's up?, are the element sets only valid for a finite
|>amount of time? How often should one get updated lists? Secondly, I'm using

Yes, they are accurate for a finite amount of time. Orbital adjustments are made from time to time which really mess up the predictions as the orbit has changed. Plus the predictions are not 100% accurate. There predictions are based upon models and have a finite accuracy. The result is that for low orbit birds like MIR where you only get a 10-15 minute pass, you want element sets that are around 2 weeks old or so. Older ones might work, but since they are easy enough to get, keeping current is a good practice.

|>a 1/4 wave ground plane antenna with about 25 W from an IC-27A, I can hear
|>MIR on occasion is there anyway to verify that MIR could hear me? It seems to
|>always be busy, when(if) I get the opportunity to connect I'd like to be
|>sure that MIR can hear me. Thanks in advance for any help you can provide.

If you got back a Busy rejection from the MIR BBS, then you were heard! 25 W should do fine, but it really depends upon the amount of QRM. Since many stations try to work MIR at the same time, only one can get into the BBS. The rest end up being QRM that interferes with MIR's ability to hear the station that is connected. Always monitor the downlink and wait until the currently connected station disconnects. Otherwise you just contribute to the QRM.

73,
Todd
N9MWB

759. Cool Sat/net news...

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 19:24:30 UTC
From: pete@wybbs.mi.org
Message-ID: <Cq9sKy.97D@wybbs.mi.org>
Source record: 27422

From Information Week, May 30, 1994:

"IN SHORT
Satellite Superhighway
Satellite transmission, rather than cable TV or optical fiber, could be the primary conduit for the information superhighway by the end of the century, says a new study by New York-based Deloitte & Touche. Satellites will offfer more channels and broader delivery because they are able to reach areas that are not wired to the national information infrastructure. The report, entilted "Speeding Toward The Interactive Multimedia Age", is available from Deloitte & Touche's Washington office".

That's cool. I hope some of this technology makes it to the Amateur Space efforts. TCPIP into a bird, with a full gateway to the main internet backbone.. from my backyard? Excellent!

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-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
Pete Hoffswell |N9SSA |Internet: pete@wybbs.mi.org
Holland, Michigan |616-395-5551 | Packet: n9ssa@wa8ure.#swmi.mi.usa.na
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
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760. AO-27 Success!

Newsgroup: rec.radio.amateur.space
Date: 1994-05-23 22:10:05 UTC
From: greg@core.rose.hp.com
Message-ID: <CqA08u.4C3@icon.rose.hp.com>
Source record: 27412

Hi, folks,

I finally was able to get into AO-27 this weekend! My problem before seems to be related to my Icom R-7000 receiver (plus an external preamp) not being able to hear the bird. I got a fine signal going into the 430 module in my base rig (Yaesu 767GX), so I thought I'd try running half duplex, and it worked! I still don't know how I sounded, but the reports were that I had a good signal. I was running about 30 watts into a homemade (poorly) 5 element beam at the end of 60' of RG-8.

The downlink is still a bit of a problem. The signal can go from full quieting to zip in a matter of a few seconds. I don't know if this is due to polarization, obstructions, atmospherics, or something else. My antenna is fixed in elevation at about 10 degrees, and horizontally polarized. It's an 8 element Quagi (better construction than the 2m beam, but still not perfect). Reception didn't really start until the satellite was well above the horizon (say, 25 degrees on a 45 degree pass), and it ramped quickly to a good level. Sorry, but I didn't check the S-meter. It wavered a bit, dropped out, came back, and then dropped out for good. That was again about 20 degrees up. With those elevations, and a 500 mi orbit, that makes for a real quick pass. The uplink antenna, BTW, is vertically polarized.

Thanks to all those who helped me get on this bird! Hope to hear you on an upcoming pass.

Greg KD6KGW

p.s. Any idea why my Icom R-7000 appears to be so deaf? I know the specs aren't as good as the Yaesu (.5uv vs .32uv sensitivity), but the 10db preamp should more than make up for it.

761. APT-Satellites: Report MAY 22, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-05-24 07:11:21 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-240594070933@129.26.163.253>
Source record: 27413
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, MAY 22, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.40 On (weak)
Meteor 3-5: APT 137.85 On

NOAA-10 is near NOAA-12, NOAA-10-APT is off to avoid interference
(VHF-conflict).
Meteor 3-5 was to be switched off MAY 21 according to the last
FANAS-info but APT was active during late afternoon ascending
orbits on MAY 22 (low sun-angle vis-images).

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

762. Gear for starting satellite station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-24 13:00:18 UTC
From: "Walter K. Daniel KE3HP" <wk02593@worldlink.com>
Message-ID: <2978870298.0.wk02593@worldlink.com>
Source record: 27414

Here are two approaches for starting a satellite station based on my experience of the past few years. Perhaps the most important beginning point is reading The Satellite Experimenter's Handbook (TSEH) from the ARRL.

1. Digital satellite reception, spacecraft telemetry

If you are mostly interested in receiving information from digital satellites, you can easily begin with DOVE (DO-17). The gear needed for DOVE will also allow you to receive SAREX, Mir, and AO-21 transmissions. Transmitting to the Shuttle or Mir is possible if you don't mind odd hours or if you invest in a beam antenna (see "You, too, can contact space!" by Michael Bass N7WLC/5 in the May/June 1993 issue of The AMSAT Journal).

The three components you need are a 2m FM transceiver, a 2m antenna, and a packet terminal node controller or TNC. I started off with an HT (Kenwood TH-27A, about $300 new), but any decent 2m FM rig will work. Start with an omnidirectional antenna such as a quarter-wave ground plane. You can build one (see TSEH for details) or buy one such as the MFJ-1740 for about $13. My first TNC was a PacComm HandiPacket portable, but any VHF TNC such as the MFJ-1270 (about $120) is fine. Of course, you need a computer to use with the TNC.

DOVE transmits packet telemetry and messages on 145.825 MHz. You can also receive traffic from the Mir packet mailbox on 145.55 MHz. In recent years, the cosmonauts haven't been using voice much, but you're suitably equipped if they do. The Shuttle sometimes carries SAREX (Shuttle Amateur Radio Experiment) and can transmit packet or voice on 145.55 MHz. In addition to its FM repeater and digital voice downlinks, AO-21 has been transmitting some packet telemetry on 145.987 MHz recently. Finally, you can also work terrestrial packet and 2m voice for repeaters and nets.

If your long-term goal is to work the Pacsats, you can plan ahead for 9600 bps FSK operations. Some of the new FM rigs have 9600 bps modem connectors so you don't have to perform surgery on the radio. You can buy a PacComm TNC with the 9600 bps modem installed for a bit over $200, not too much more than the cost of a TNC. The versatile DSP boxes cost much more (over $500), but offer capabilites to work many digital modes including 9600 bps FSK.

2. Analog (voice and CW) operation

If you are mostly interested in speaking to or exchanging CW with other hams, try RS-10 Mode A and/or RS-12 Mode K. For more details, see my article "Getting Started with RS-10" in the August 1993 QST or the article by Robert Capon WA3ULH "Working Satellite RS-12..." in the February 1994 QST.

For reception of either satellite, any HF or 10m rig will work. I have a used Uniden HR-2600, but you can still buy them new for $200. A 10m dipole

antenna works well--build your own or buy one (about $20). To transmit to RS-10, you need a 2m rig with CW and USB modes. These rigs are not as common as FM rigs and cost a bit more. My Kenwood TR-751A cost about $600 new. To transmit to RS-12, you need to use the 15m band. The RS-12 transponder input lies in the Advanced/Extra class subbands, so make sure you have the privileges before you transmit.

The RS-10 CW beacon at 29.357 MHz is strong. The RS-12 CW beacon is also strong at 29.408 MHz. Operation on these satellites is full duplex (you hear yourself from the satellite), so headphones are necessary. If you have a 2m multimode rig like I do, you can work other non-satellite modes: 10m voice or CW, 2m FM voice for nets and repeaters, 2m terrestrial packet with a TNC, and terrestrial 2m SSB or CW weak-signal operation.

The addition of a 70cm antenna ($60 for a small yagi) and a 70cm-to-10m downconverter (about $100) will turn a Mode A station into a Mode JA station.

The only satellite currently operating JA is FO-20, but Phase 3D will likely spend some time in this mode. The addition of a PSK modem (about $200) and TNC ($120) brings Mode JD capability for the 1200 bps Pacsats. Alternatives include the combined PacComm TNC/PSK modem (about $270) or a DSP box.

73, Walt KE3HP

763. * SpaceNews 23-May-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-05-24 13:55:09 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0523.1994@ampr.org>
Source record: 27417
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

Hi folks.

Sorry if this is a dupe, but I've been having a lot of trouble with mail lately.

73, de John, KD2BD

SB NEWS @ AMSAT $SPC0523
* SpaceNews 23-May-94 *

BID: $SPC0523

=========
SpaceNews
=========

MONDAY MAY 23, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* LUSAT-1 CRASH RECOVERY UNDERWAY *
==================================
On 16-May-94 while LU1JBR and other stations were operating LUSAT-1 (LO-19), the satellite's downlink vanished, a result of an on-board computer crash. By 17-May-94, LUSAT-1 command station (operated by Norberto Pennini, LU8DYF), successfully reset the satellite.

Norberto will start a series of deep tests and studies in order to find the origin of the crash. Reloading of operating software will follow the study. Please note that the satellite will not be operational for regular users for the next 7 to 30 day period.

LUSAT-OSCAR-19 controllers would like to thank LU8DYF and other stations who, in a way or another, collaborated and made this operation a success, including: LU6DYD, LU7AKC, LU7DSU, LU8ENU, LU4AGC, LU1EXC, LU2BDT, LW1EEO and LU3AGY.

[Info via Eduardo Sweet, LU7AKC]

* AMSAT CALL FOR PAPERS *
=========================
Share your experience with the amaeur satellite community at the 1994 AMSAT-NA Annual Meeting and Space Symposium scheduled for 07-Oct-94 through 09-Oct-94 in Orlando, Florida. Come help celebrate AMSAT's 25 year

presence in Space. Your help is needed to make this meeting a success.

Papers for this meeting are sought. Editing, formatting, graphics and even typing can be provided if required. Prepare a paper and advance your reputation among others involved in the Amateur Satellite program! Even if you cannot attend the meeting, consider a paper for publication.

Topics for all amateur satellite disciplines are sought. Author and Title requested ASAP. Compose a short abstract by July 1. Final drafts are requested on or about August 26.

Direct inputs and inquiries to:
Steve Park - WB9OEP
12122 99th Ave. N.
Seminole, FL 34642
Phone: (813) 391-7515
Internet: SKPA@QMGATE.ECI-ESYST.COM
Amateur Packet Radio: WB9OEP @ W4DPH#TPA.FL.EL87OW

Join us in Orlando, Florida for the fun and festivities!

[Info via Steve Park, WB9OEP]

* CLEMENTINE FAILURE *
==========
After successfully completing a mission using advanced ballistic missile defense technologies to map the entire surface of the moon, the Ballistic Missile Defense Organization's Clementine satellite suffered an on-board malfunction at 9:39 AM EST on 07-May-94. The likely result of this malfunction will be to prevent Clementine from performing the planned close fly by of the near-Earth asteroid Geographos in August 1994, and for the satellite to point its cameras and sensors.

Preliminary analysis has traced the cause of the malfunction to the on-board computer which controls most of the satellite's systems including the attitude control thrusters. The computer activated several thrusters during a 20 minute telemetry interrupt with the ground station, thus depleting all the fuel in the Attitude Control System (ACS) tanks. It has not been determined as yet whether the fault was in the computer software or in the computer's electronic chips. The primary processor on the computer is a radiation hardened Military Standard 1750A computer, which is not experimental technology.

Clementine's mission control center in Alexandria, VA. is continuously monitoring the satellite. It has been determined that all instruments and systems are continuing to function well with the exception of the ACS.

Although it may be difficult to Clementine to make the close fly by of the asteroid, the satellite will continue to perform its intended military mission to test 23 advanced technologies. The Clementine engineering team is examining several mission options which would continue to yield useful data. Since January 25, 1994, Clementine's cameras have recorded over 1.5 million images including the topographical surface of the moon. Analyzing

this data, including results of the search for the existence of ice on the lunar surface, will continue to occupy scientists for many years.

The Clementine project is managed by BMDO, built by the Naval Research Laboratory, and its instruments constructed by industry and the Lawrence Livermore Laboratory. It has been a landmark project since it demonstrates that small, highly capable satellites can be built and launched for under $100 million and in less than two years, using advanced miniaturized technology and a streamlined management approach.

[Info via Richard H. Buenneke Jr.]

* DISCOVERY OF ASTEROID MOON *
==========
NASA's space probe Galileo has discovered what is probably the first known moon of an asteroid. Since Galileo passed the asteroid, Ida, on August 28, 1993, the probe has continued to send back images and data from the near infrared mapping spectrometer. Because of the great distance at which the probe is from Earth, downloading this data will continue for months to come.

The Galileo Porject Scientist, announced on March 3, 1994, the discovery of a "blip" consisiting of more than a few pixels visible in data from both the solid-state imaging system and the spectrometer.

Based on simultaneous observation, a natural moon may be in orbit around Ida. If so, this would be the first satellite of an asteroid to be discovered.

More information will be forth coming soon from NASA, along with the first images of this possibly new moon orbiting Ida.

[Info via Dave, N9JUW]

* ECLIPSE IMAGE AVAILABLE VIA FTP *
==========
A collection of images taken of the 10-May-94 annular solar eclipse have been assembled into a single file and is available via anonymous FTP at: ftp.uleth.ca (IP # 142.66.3.29). The image is called "eclipse.gif" and is located in the "pub/solar/Images" directory at this site. The frame contains 24 high-quality images taken by the Big Bear Solar Observatory. All but three are full-disk hydrogen-alpha and Ca II K images, giving excellent views of existing features visible on the Sun (regions of enhanced plage, filaments, etc). The other three images are high-resolution close-up images of the Sun showing craters and mountain ranges against the background of the solar surface. "eclipse.gif" is a large 1500 x 1297 x 256 image that will make good use of large high-resolution monitors.

The folks at the BBSO did a great job capturing these images, and deserve a nice pat on the back for covering the event so well.

"eclipse.gif" is in a semi-permanent state. That is, it will not be removed from the FTP disk for a few months.

[Info via Cary Oler]

* RS-10 NEWS *
==============
VE3CIQ in Canada reports that RS-10 is working quite well in Mode A. In one Atlantic pass, he made contact with FG5GI from Guateloupe Island, ON2ATB from Belgium, and N1MCT from Maine, USA using 25 watts of transmitter power. VE3CIQ reports he can hear himself with only 5 watts.

[Info via VE3CIQ]

* SpaceNews IN SPANISH *
========================
Pedro Jose, EA4ADD in Spain is translating SpaceNews issues into the Spanish language and circulating the translated issues throughout the LATNET (Latin America) and the EA (Spanish) packet radio networks.

My thanks to EA4ADD for taking the time to translate SpaceNews into Spanish.

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

ON1AOT VK2XCI VE3CIQ EA4ADD N6UVY WB9OEP W0XK

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

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John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.de.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

764. International Space Development Conference

Newsgroup: rec.radio.amateur.space
Date: 1994-05-24 14:17:23 UTC
From: white@eol.ists.ca
Message-ID: <1994May24.141723.3487@newshub.ists.ca>
Source record: 27415
Cross-posted to:
can.schoolnet.space.jr,can.schoolnet.space.sr,ists.space,rec.radio.amateur.space,tor.general,ont.general,york,general

Dear Space Enthusiast:

I would like to take this opportunity to invite you to attend the International Space Development Conference, the National Space Society's 13th annual conference, which will be held in Toronto from May 26 to 30, 1994 at the Regal Constellation Hotel. Attendance is anticipated at 500-1000.

This is a four day conference where space experts from industry, governments, the general public, professional organizations, and educators come to see and share the latest in space projects and plans. Much of the focus of the conference is on the more speculative aspects of long term space travel and the human "outward urge" which will propel our species to the planets and to the stars. Apollo astronaut Buzz Aldrin; Roland Dore, President of the Canadian Space Agency; Bob MacDonald, host of CBC's Quirks and Quarkrs, as well as Canadian astronauts Ken Money, Mike McKay, and Chris Hatfield are keynote speakers.

ISDC94 features talks on space medicine, education, and technology, an art show, a special Kids Conference, Internet Friday, and Rocket Workshops.

Registration is $90 USA/ $110 CDN at the door; the student and senior rate is $30US/ 35 CDN.
The day pass rate is 1/3 door rate.

ISDC hotel rates are: $ 87 CDN/ 67 US for a single or double room, and $97.00 CDN for triple/quad occupancy.
Hotel reservations can be made by calling: (416) 675-1500 or toll free at 1-800-268-4838.

For further information on ISDC94, you can contact one of the organizers listed below:

Paul Swift (416) 695-3343 pswift@caisu.ists.ca
Christine Marton (416) 699-0591 marton5@vrg.utoronto.ca
Wayne Sincarsin (416) 889-0327
Chris Coggon (416) 665-5413 coggon@ists.ists.ca

Christine Marton
Micronet
marton5@vrg.utoronto.ca
tel: 416-978-1638

765. LUSAT-1 (LO-19): Actual status

Newsgroup: rec.radio.amateur.space
Date: 1994-05-24 15:24:30 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.J4gumc1w165w@asarin.org.ar>
Source record: 27416

Official LUSAT-1 Status Report

The satellite LUSAT-1 seems healthy. The software load was intentionally stopped when the second module was just loaded and turned on.

The next step will be to continue with the satellite's deep tests.

The satellite is sending telemetry on 437.125 MHz and it's digipeater is turned on.

Overseas stations: If you capture any LUSAT-1 telemetry and send it in raw-mode to the satellite control station, you'll receive a certificate for your collaboration. These telemetry reports can be sent either via packet radio to LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Internet to: lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS is NOT LOADED and it will NOT be operational for the next 3 weeks (approx.).

We want to thanks LU8DYF and all the other stations that helped in the LUSAT-1 recovery: LU1DBC, LU1EXC, LU1FYZ, LU2BDT, LU2FHE, LU3AGY, LU4AGC, LU4FIO, LU6DYD, LU7ABF, LU7AKC, LU7DSU, LU7XAC, LU8ENU and LW1EEO.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)
packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

766. Interested in starting w/ Sat

Newsgroup: rec.radio.amateur.space
Date: 1994-05-24 21:05:06 UTC
From: blaknite@pipeline.com
Message-ID: <2rtq62$lnr@pipeline.com>
Source record: 27419

Hey everyone. Since HF is in the pits now, I'm thinking about getting into satelites, since the VHF in my area (New York City) stinks, and my all band dipole is on the ground (no 40 or 80 meters) which leaves me with my 3 element tri-bander. I've been playing with RS-12, since it's the only one I know of right now that is an all-HF bird. The only problem is that even on a direct pass, the most I can get is 17 or so minutes, and only 13 or so are decent. I would like to start with the SSB and CW VHF/UHF birds. I have the following questions:
1. What rig should I look into getting? I'm thinking about the new Icom all-mode 2m/440 (Can't remember model #...it was in the latest QST) Any hints?

2. Antenna wise, any ideas? I have a tri-band Yagi on the roof now on a regular mid-sized rotor. I was thinking about getting so moderate sized 2m/440 yagis, but what kind? Should I invest in an alt/az rotor...that is a big investment in both time and money, since I'd have to put another tower up on the roof...What kind of antennas should I look for?

Anyway, that's just the beginning. Any helpful information would be greatly appreciated! Thanks...

Noah AA2KT
blaknite@pipeline.com

767. Re: Interested in starting w/ Sat

Newsgroup: rec.radio.amateur.space
Date: 1994-05-25 09:07:13 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994May25.090713.17313@ke4zv.atl.ga.us>
Source record: 27425

In article <2rtq62$lnr@pipeline.com> blaknite@pipeline.com (Noah Lehmann-Haupt) writes:
>1. What rig should I look into getting? I'm thinking about
>the new Icom all-mode 2m/440 (Can't remember model #...it was
>in the latest QST) Any hints?

Well, it's brand new, so there's no history on it yet. The rig most frequently heard on the satellites is the Yaesu FT736R and it's older cousin the FT726R. Those are followed by the fancy IC970 and the Icom separates, IC275 and IC475. The newest Icom rig *looks* promising, but we don't know how well it actually works yet. If you get one, let us know. :-)

(The one rig I'd steer you *away* from is the Kenwood 790. It can work, but it's an ergometric nightmare. The thermal design of the radio is also bad. It gets real hot real quick because the output bricks aren't well designed or matched. If you operate it throttled way back to drive external amps, it may do OK.)

>2. Antenna wise, any ideas? I have a tri-band Yagi on the
>roof now on a regular mid-sized rotor. I was thinking about
>getting so moderate sized 2m/440 yagis, but what kind? Should
>I invest in an alt/az rotor...that is a big investment in both
>time and money, since I'd have to put another tower up on the
>roof...What kind of antennas should I look for?

Alt-Az rotators are a must for serious satellite work. You can save some money by buying only a KR-500 elevation rotator and mounting it just above your tri-bander at *right angles* to the tri-bander's boom. This will allow the VHF/UHF beams to elevate with their rear sections coming down *between* the tri-bander's elements. Just remember that your azimuth rotator is 90 degrees off when using the satellite beams. (You'll get less than 90 degrees elevation using this method before the VHF/UHF beams hit the boom, but that's workable.) It's better to have fully dedicated alt-az rotators free of HF beam interference, especially if you're considering auto-tracking. But, of course, that costs more money and means some re-engineering of the tower mechanics. IE you can use a tall enough mast to put the beams high enough above the tri-bander to allow full motion, but that makes them much more susceptable to wind damage.

Better is to re-install the tri-bander down the tower a bit using a Ring-rotor to walk the beam *around* the tower. Or you can use a separate tower. Remember, your antennas spend most of their time looking up, so a tall tower isn't essential. All you really need is a mast tall enough to allow the antenna's rear elements to clear

the ground when at 90 degrees elevation. A taller tower can be helpful when the satellite is near the horizon and you have local obstructions to clear.

As to which beams, the KLMs are by far the favorites. The KLM22C and KLM40CX are preferred. Use good mast mounted preamps. It's usually best to use a very low loss transmit coax and a separate receive coax with switching on the tower. Thanks to the preamp, the receive coax doesn't have to be anything special. Doing it this way, you're less likely to burn up a preamp if you transmit a blip of RF at the wrong time.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

768. Re: Gear for starting satellite station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-25 13:00:04 UTC
From: northup@hoop.sw.stratus.com
Message-ID: <2rvi4l$bqr@transfer.stratus.com>
Source record: 27418

wk02593@worldlink.com ("Walter K. Daniel KE3HP") writes:
: Here are two approaches for starting a satellite station based on my
: experience of the past few years. Perhaps the most important beginning point
: is reading The Satellite Experimenter's Handbook (TSEH) from the ARRL.
:
:
: 2. Analog (voice and CW) operation
:
: If you are mostly interested in speaking to or exchanging CW with other hams,
: try RS-10 Mode A and/or RS-12 Mode K. For more details, see my article
: "Getting Started with RS-10" in the August 1993 QST or the article by Robert
: Capon WA3ULH "Working Satellite RS-12..." in the February 1994 QST.
:
:
: 73, Walt KE3HP
:

Thanks for this posting. I was just thinking about trying Satellite
out and after your post yesterday I went home, found and read the
Feb. 1994 QST article.

I was able to find the beacon fine and as it started to get strong
I looked around the receive band and found someone calling CQ on
21,230. I set my Tx to 29,430 and tried to respond but wasn't able
to make contact.

I had the feeling that I wasn't close enough to the frequency that
was hearing and that other were so they were able to make a contact
where I couldn't. Are there any hints or tricks for better choosing
the Tx frequency ? I'm ready to try again tonight.

Bill

--
--

Bill Northup PHONE: (508) 460-2085
Stratus Computer Inc. INTERNET: northup@sw.stratus.com
55 Fairbanks Boulevard Packet: N1QPR@WA1PHY.#EMS.MA.USA.NA
Marlboro, MA 01752 Amateur Radio: N1QPR

769. Re: Gear for starting satellite station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-25 16:44:47 UTC
From: greg@core.rose.hp.com
Message-ID: <CqDAIn.4Ko@icon.rose.hp.com>
Source record: 27420

Bill Northup (northup@hoop.sw.stratus.com) wrote:
: I was able to find the beacon fine and as it started to get strong
: I looked around the receive band and found someone calling CQ on
: 21,230. I set my Tx to 29,430 and tried to respond but wasn't able

Bill,

If you're trying to get into RS-12, the uplink frequency is in the 15 meter band, and the downlink is in the 10 meter band. Looks like you have them switched. I believe the downlink is from 29.410 - 29.450, with the beacon at 29.407. I don't know how you heard the beacon on 15 meters...
The person calling CQ was probably heard on the way up, not down. You could have worked him simplex, but that wouldn't be as much fun.

The easiest way to "find yourself" is to find an open spot in the downlink window to park your receiver, then set the transmitter to where it would be if there wasn't any doppler. If you're, say, 20khz down from the upper pass band (29.430), set your transmitter 20khz down from whatever the uplink window is. If I recall correctly, the last two digits in the frequency will match on the RS satellites. From that point, send a series of dits, say something, or in some way transmit a recognizable signal and *slowly* move the *transmitter* frequency up until you hear your own signal clearly. With RS-12 you shouldn't have to move it very far, a few KHz at most. My passes with RS-10 usually start at 29.380 downlink and 145.880 uplink (note the matching 80's) and depending on the pass I'll hear myself between 145.882 and 145.885.

Good luck, and enjoy!

Greg KD6KGW

770. Motorola GPS engine purchase information

Newsgroup: rec.radio.amateur.space
Date: 1994-05-25 18:22:04 UTC
From: bonomo@specxn.enet.dec.com
Message-ID: <1994May25.182204.12821@nntpd2.cxo.dec.com>
Source record: 27421

Greetings, one and all!

This message is ASCII text, formatted as <CR> at =<78 characters, tabs at +8.

Have finally received "everything" which I will obtain from Motorola and Trimble, and the order requests have dwindled to a minimum, I have attached the specifications and pricing below.

In a nutshell, the Motorola unit is better in every way, excepting three factors. The Trimble unit:

1) is about 1/8" smaller in width and height,
2) is about .6 ounce lighter,
3) consumes less power in standby, quoted as ~2uA nominal, versus the Motorola's stated maximum of 60uA.

Other than that, the Motorola VP Oncore engine is superior in all ways, including price. The recommendation, from my perspective, is to choose the Motorola unit, but your choice may vary. The above factors, in which the Trimble unit is superior, may be significant ones for you.

I have had requests from 375 individuals, from nine countries, for over 435 units. All this is, of course, based on a "$150" purchase price, which is not available.

Understanding this, it seems best if there is a "standard" configuration which is ordered, as the pricing given is for quantities of 100 and greater. If 100+ want the options, we'll order those, too. Remember, all prices are for 100+ units per item. In other words, if 25 units are wanted with the LNA option, the pricing for that LNA option will be be somewhat higher than the figure quoted below, and I'm not sure if Motorola can (or will) handle one-sie, two-sies and get it right.

****
The recommended "standard" configuration:

Item Price / each (includes Colorado State sales tax)

VP Oncore engine $268
Active Antenna $ 70
Cable to antenna $ 22

Total "standard" $360

****

Options to be considered:

LNA $ 16
battery $ 11

Shipping within the continental U.S., via 2nd day service, will run $10. This includes a box, packing foam and shipping charges. This figure is good for up to ten units.

Those interested in this group purchase should remit monies to the name and address below. Please send non-cash such as personal checks, money orders or the like, as it allows records to be kept much more easily. If less than 100 orders are placed, the checks/money orders will be destroyed, rather than incurring the cost of returning up to 100 of them. Alternately, if you want your check returned in the event of an insufficient number of units ordered, add a dollar bill to cover the cost of an envelope, stamp and my or my wife's writer's cramp which will inevitably result. If the order threshold is reached and an order is placed with Motorola, the $1 will be returned to you with your order. Please include a very complete address to which the order may be sent. Include your current Internet address and telephone number(s) where you may be reached, as well. I've experienced several Inet addresses which have bounced, by the way, so if you didn't receive a response from me directly, it was attempted.

Send orders to:

Thomas A. Bonomo
8147D Summerset Drive
Colorado Springs, Co. 80920.6123

I can be reached, and have been by several individuals, at:

Telephone: (719)593.9883 Home (evenings, weekends)
(719)592.5105 Office (weekdays)
Internet: tom.bonomo@cxo.mts.dec.com

This message will be posted to the newsgroups, as well.

Thanks for your patience as I've gathered information and responded to each of your requests.

Regards,

Tommy

Specifications and pricing information follows.

/\

/\

Motorola VP ONCORE SPECIFICATION DATA SHEET

Receiver Architecture
----
o 6 channel

o L1 1575.42 MHz
o C/A code (1.023 Mhz chip rate)
o Code plus carrier tracking (carrier aided tracking)

Tracking Capability
---
o 6 satellite vehicles simultaneously

Dynamics
---
o Velocity: 1000 m/s when altitude less than 18 km
o Altitude: 18 km for velocities greater than 514 m/s
o Accelleration: 4 g

Antenna
---
o accepts active and passive antennas

Acquisition Time

(TTFF = Time To First Fix)
o 22 sec. typical TTFF (with current almanac, position, time and ephemeris)
o 48 sec. typical TTFF (with current almanac, position and time)
o 2.5 seconds typical re-acquire

Accuracy
---
o Position: less than 25 meters, SEP (without SA).
DoD may invoke Selective Availability (SA), potentially degrading accuracy to 100 meters (2 dRMS)

DATUMs
---
o 49 std. datums, 2 user defined, default WGS-84

Signal Level
---
o TTL

Output Messages
---
o Latitude, longitude, height, velocity, heading, satellite tracking status (Motorola Binary Protocol)
o NMEA-0183 Version 2.00 (GGA, RMC, GLL, GSA)
o LORAN emulation mode
o Software selectable

Operating voltage
---
o 4.75 - 5.25 VDC, 50 mVp-p ripple

Operating current
----
o 230 mA typical @5V, 275 mA max at 5.25V

Standby voltage
----
o 2.5 - 5.0 VDC

Standby current
----
o 60 ua max

Dimensions
----
o 2.00" x 3.25" x .64" (50.80mm x 82.55mm x 16.26mm)

Weight
------
o 1.9 oz. (53.9g)

Connectors
----
o Digital: 10 pin (2 x 5) header on .100" centers
o RF: right angle OSX (sub-miniature snap-on)

Operating Temperature
----
o -30 - +85 degrees C (without on-board battery)
o -20 - +60 degrees C (with on-board battery)

Storage Temperature
----
o -30 - +85 degrees C (without on-board battery)
o -20 - +60 degrees C (with on-board battery)

Humidity
----
o 95% RH, non-condensing

Vibration
----
o 7.7 g, random (survivability)

MTBF
----
o >61,000 hours (estimated)

Optional features
----
o Lithium battery
o Low Noise Amplifier
o Real Time Clock

Pricing (includes Colorado state sales tax)

VP Oncore engine $268
Active Antenna $ 70
Cable to antenna $ 22
Low Noise Amp $ 16
Lithium Battery $ 11

Development Software
1st option $270
includes:
Raw code phase,
disc data,
smooth sat time,
carrier phase

2nd option $215
includes:
above without
carrier phase

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Specifications for Trimble SVeeSix GPS engine

Model: SVeeSix-CM2

General

L1 Frequency, C/A code (SPS), 6 channel, continuous tracking receiver

Update Rate

NMEA - 1Hz

Accuracy

Position: 25m without SA
Velocity: 0.1m/s without SA
Time: 1 us (nom)

DGPS Accuracy

Position: 2m to 5m (2 sigma)
Velocity: 0.1m/s
Time: 1 us (nom)

Acquisition (typ)

Cold Start: 2 to 5 minutes
Warm Start: 50 sec with time upload
Hot start: 30 sec with time upload

Reaquisition

<2 sec

Dynamics

Velocity: 500 m/sec max
Acceleration: 4g
Jerk: 20m/sec^3

Environmental Specs.

Operating temp: -10C to +60C
Storage temp: -55C to +100C
Vibration: 0.008g^2/Hz 5Hz to 20Hz
0.05g^2/Hz 20Hz to 100Hz
-3dB/octave 100Hz to 900Hz

Operating Humidity: 5% to 95% RH non-condensing @+60C
Altitude: -400m to +18000m

Physical Characteristics

Dimensions: 3.25" x 1.83" x 0.58"
Weight: 1.3 oz. (36.4g)
Connectors: RF: SMB, I/O: 8 pin (2x4), 2mm header

Technical Specifications

Prime power: +5Vdc (-3% to +5%)
Power consumption: 280 ma, 1.40 watts
Backup power: +3 to +5 Vdc
Backup consumption: 1 uA @3V and +25C (nom)
Serial port/1PPS: CMOS TTL
Protocol options: TSIP @9600 baud, 8-O-1
NMEA 0183 v2.0 @4800 baud, 8-N-1
TAIP @4800 baud, 8-N-1

NMEA messages: Standard: GGA,VTG
Optional: GGA,GLL,VTG,ZDA,GSA,GSV,RMC

Pricing (includes Colorado state tax)

SVeeSix CM2, DGPS capable $321
Antenna (includes cable) $118

/\

771. Re: Gear for starting satellite station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-25 18:35:52 UTC
From: northup@hoop.sw.stratus.com
Message-ID: <2s05q8$1v5@transfer.stratus.com>
Source record: 27423

greg@core.rose.hp.com (Greg Dolkas) writes:
: Bill Northup (northup@hoop.sw.stratus.com) wrote:
: : I was able to find the beacon fine and as it started to get strong
: : I looked around the receive band and found someone calling CQ on
: : 21,230. I set my Tx to 29,430 and tried to respond but wasn't able
:
: Bill,
:
: If you're trying to get into RS-12, the uplink frequency is in the 15 meter
: band, and the downlink is in the 10 meter band. Looks like you have them
: switched. I believe the downlink is from 29.410 - 29.450, with the beacon
: at 29.407. I don't know how you heard the beacon on 15 meters...
: The person calling CQ was probably heard on the way up, not down. You could
: have worked him simplex, but that wouldn't be as much fun.
:
I did have the uplink and downlink frequencies right on the radio (I was
double checking everything)- is just my fingers that couldn't get them right
when I was typing.

: The easiest way to "find yourself" is to find an open spot in the downlink
: window to park your receiver, then set the transmitter to where it would be
: if there wasn't any doppler. If you're, say, 20khz down from the upper
: pass band (29.430), set your transmitter 20khz down from whatever the uplink
: window is. If I recall correctly, the last two digits in the frequency will
: match on the RS satellites. From that point, send a series of dits, say
: something, or in some way transmit a recognizable signal and *slowly* move the
: *transmitter* frequency up until you hear your own signal clearly. With RS-12
: you shouldn't have to move it very far, a few KHz at most. My passes with
: RS-10 usually start at 29.380 downlink and 145.880 uplink (note the matching
: 80's) and depending on the pass I'll hear myself between 145.882 and 145.885.
:
: Good luck, and enjoy!
:
: Greg KD6KGW

Thanks for the information - I will be back trying again tonight.

Bill

--
--

Bill Northup PHONE: (508) 460-2085
Stratus Computer Inc. INTERNET: northup@sw.stratus.com
55 Fairbanks Boulevard Packet: N1QPR@WA1PHY.#EMS.MA.USA.NA
Marlboro, MA 01752 Amateur Radio: N1QPR

772. OSCAR ANTENNAS

Newsgroup: rec.radio.amateur.space
Date: 1994-05-26 23:39:23 UTC
From: wb8k@barf80.nshore.org
Message-ID: <c9Hymc1w165w@barf80.nshore.org>
Source record: 27426

STILL LOOKING FOR INFO, COMMENTS, SUCCESS/HORROR STORIES CONCERNING
OSCAR ANTENNAS.. WHO IS USING WHAT AND WHY.. WHAT'S WORKING
KLM? M-SQUARED? HY-GAIN ETC ETC..
** ALSO LOOKING FOR AGOOD (CHEAP) SOURCE OF FIBERGLASS TUBING 2"0D .25
WALL IN 5 TO 12 FT LENGTHS...
I'M IN THE PROCESS OF REVAMPING THE MODE B AND S ANTENNA SYSTEM.

Dennis jakubisin
InterNet: wb8k@barf80.nshore.org
Basic Amateur Radio Frequency, BARF-80 +1 216/237-8208
"Totally devoted to Amateur Radio" - 24 Hrs a day 8/N/1 14.4k-300 baud

773. Re: OSCAR ANTENNAS

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 14:23:37 UTC
From: "William P. Osborne" <wosborne@nmsu.edu>
Message-ID: <40905.wosborne@nmsu.edu>
Source record: 27436

On Thu, 26 May 94 19:39:23 EDT,
Dennis jakubisin <wb8k@barf80.nshore.org> wrote:

>STILL LOOKING FOR INFO, COMMENTS, SUCCESS/HORROR STORIES CONCERNING
>OSCAR ANTENNAS.. WHO IS USING WHAT AND WHY.. WHAT'S WORKING
>KLM? M-SQUARED? HY-GAIN ETC ETC..
Dennis for what it is worth I had the Hygain sat antenna set and my buddy down the road had the KLM's. Get the KLM's better build and polarization switch worked much better and did not change in the rain. The hygain's I had were useless when wet the SWR when up above 3:1. I also have m^2 hf antennas and they are great electrically but only so so mechnically.
73 Bill AA5ZQ

774. ORBS$147.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 15:28:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-147.o.1994@ampr.org>
Source record: 27432
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-147.O
Orbital Elements 147.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX May 27, 1994
BID: $ORBS-147.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94142.44873866
Element set: 285
Inclination: 27.1282 deg
RA of node: 326.3729 deg
Eccentricity: 0.6021350
Arg of perigee: 180.2426 deg
Mean anomaly: 179.1822 deg
Mean motion: 2.05879809 rev/day
Decay rate: -5.5e-07 rev/day^2
Epoch rev: 8225
Checksum: 310

Satellite: UO-11
Catalog number: 14781
Epoch time: 94143.03061883
Element set: 695
Inclination: 97.7875 deg
RA of node: 158.9341 deg
Eccentricity: 0.0012137
Arg of perigee: 356.6640 deg
Mean anomaly: 3.4484 deg
Mean motion: 14.69211582 rev/day
Decay rate: 2.76e-06 rev/day^2
Epoch rev: 54661
Checksum: 320

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94143.06202902
Element set: 904
Inclination: 82.9244 deg
RA of node: 347.4186 deg
Eccentricity: 0.0013145
Arg of perigee: 90.9237 deg
```

Mean anomaly: 269.3425 deg
Mean motion: 13.72337109 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 34646
Checksum: 292

Satellite: AO-13
Catalog number: 19216
Epoch time: 94144.40940288
Element set: 919
Inclination: 57.8423 deg
RA of node: 251.0411 deg
Eccentricity: 0.7206867
Arg of perigee: 342.2489 deg
Mean anomaly: 1.9918 deg
Mean motion: 2.09725094 rev/day
Decay rate: -4.61e-06 rev/day^2
Epoch rev: 4551
Checksum: 313

Satellite: FO-20
Catalog number: 20480
Epoch time: 94144.43473962
Element set: 692
Inclination: 99.0329 deg
RA of node: 300.7480 deg
Eccentricity: 0.0541340
Arg of perigee: 33.2966 deg
Mean anomaly: 330.0992 deg
Mean motion: 12.83225622 rev/day
Decay rate: -3.5e-07 rev/day^2
Epoch rev: 20108
Checksum: 283

Satellite: AO-21
Catalog number: 21087
Epoch time: 94143.50227818
Element set: 473
Inclination: 82.9413 deg
RA of node: 160.9779 deg
Eccentricity: 0.0035976
Arg of perigee: 150.2606 deg
Mean anomaly: 210.0599 deg
Mean motion: 13.74539547 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16619
Checksum: 326

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94144.13470258

Element set: 695
Inclination: 82.9224 deg
RA of node: 29.2888 deg
Eccentricity: 0.0029039
Arg of perigee: 172.4887 deg
Mean anomaly: 187.6707 deg
Mean motion: 13.74040914 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 16534
Checksum: 332

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94146.03306133
Element set: 260
Inclination: 1.8166 deg
RA of node: 100.7777 deg
Eccentricity: 0.2920956
Arg of perigee: 181.5514 deg
Mean anomaly: 176.6819 deg
Mean motion: 1.42202574 rev/day
Decay rate: -1.26e-06 rev/day^2
Epoch rev: 88
Checksum: 279

/EX

775. ORBS$147.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 15:29:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-147.d.1994@ampr.org>
Source record: 27431
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-147.D
Orbital Elements 147.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX May 27, 1994
BID: $ORBS-147.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94144.22276841
Element set: 997
Inclination: 98.5880 deg
RA of node: 229.3217 deg
Eccentricity: 0.0010181
Arg of perigee: 263.8728 deg
Mean anomaly: 96.1295 deg
Mean motion: 14.29843487 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 22616
Checksum: 328

Satellite: AO-16
Catalog number: 20439
Epoch time: 94144.20928715
Element set: 796
Inclination: 98.5965 deg
RA of node: 230.5154 deg
Eccentricity: 0.0010403
Arg of perigee: 264.3951 deg
Mean anomaly: 95.6036 deg
Mean motion: 14.29897339 rev/day
Decay rate: 2.0e-07 rev/day^2
Epoch rev: 22617
Checksum: 318

Satellite: DO-17
Catalog number: 20440
Epoch time: 94144.16596132
Element set: 796
Inclination: 98.5981 deg
RA of node: 230.7887 deg
Eccentricity: 0.0010560
Arg of perigee: 263.4989 deg
```

Mean anomaly: 96.4992 deg
Mean motion: 14.30037037 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 22618
Checksum: 329

Satellite: WO-18
Catalog number: 20441
Epoch time: 94144.21082933
Element set: 798
Inclination: 98.5971 deg
RA of node: 230.8353 deg
Eccentricity: 0.0011035
Arg of perigee: 263.3967 deg
Mean anomaly: 96.5956 deg
Mean motion: 14.30011373 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 22619
Checksum: 303

Satellite: LO-19
Catalog number: 20442
Epoch time: 94144.19061234
Element set: 795
Inclination: 98.5977 deg
RA of node: 231.0663 deg
Eccentricity: 0.0011451
Arg of perigee: 263.1040 deg
Mean anomaly: 96.8842 deg
Mean motion: 14.30107216 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 22620
Checksum: 274

Satellite: UO-22
Catalog number: 21575
Epoch time: 94144.18192998
Element set: 499
Inclination: 98.4364 deg
RA of node: 219.1638 deg
Eccentricity: 0.0008301
Arg of perigee: 8.5029 deg
Mean anomaly: 351.6298 deg
Mean motion: 14.36915556 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 14963
Checksum: 339

Satellite: KO-23
Catalog number: 22077
Epoch time: 94144.52572252

Element set: 394
Inclination: 66.0839 deg
RA of node: 329.5255 deg
Eccentricity: 0.0013803
Arg of perigee: 293.2557 deg
Mean anomaly: 66.7013 deg
Mean motion: 12.86286047 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8374
Checksum: 313

Satellite: AO-27
Catalog number: 22825
Epoch time: 94144.19661163
Element set: 293
Inclination: 98.6515 deg
RA of node: 220.2413 deg
Eccentricity: 0.0008078
Arg of perigee: 284.8036 deg
Mean anomaly: 75.2246 deg
Mean motion: 14.27623773 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 3426
Checksum: 303

Satellite: IO-26
Catalog number: 22826
Epoch time: 94144.24944208
Element set: 293
Inclination: 98.6505 deg
RA of node: 220.3266 deg
Eccentricity: 0.0008712
Arg of perigee: 287.1330 deg
Mean anomaly: 72.8895 deg
Mean motion: 14.27727519 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 3427
Checksum: 309

Satellite: KO-25
Catalog number: 22830
Epoch time: 94144.19534348
Element set: 298
Inclination: 98.5540 deg
RA of node: 217.7814 deg
Eccentricity: 0.0010495
Arg of perigee: 247.7152 deg
Mean anomaly: 112.2919 deg
Mean motion: 14.28053943 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 3427

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Checksum: 308

/EX
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776. ORBS$147.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 15:31:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-147.w.1994@ampr.org>
Source record: 27437
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-147.W
Orbital Elements 147.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX May 27, 1994
BID: $ORBS-147.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94145.66353036
Element set: 818
Inclination: 99.0554 deg
RA of node: 195.8888 deg
Eccentricity: 0.0014172
Arg of perigee: 285.4305 deg
Mean anomaly: 74.5298 deg
Mean motion: 14.13617128 rev/day
Decay rate: 8.9e-07 rev/day^2
Epoch rev: 48716
Checksum: 344

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94145.47609782
Element set: 717
Inclination: 98.5093 deg
RA of node: 155.1720 deg
Eccentricity: 0.0014363
Arg of perigee: 38.5155 deg
Mean anomaly: 321.7045 deg
Mean motion: 14.24886079 rev/day
Decay rate: 8.1e-07 rev/day^2
Epoch rev: 39937
Checksum: 334

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94145.83885770
Element set: 294
Inclination: 82.5389 deg
RA of node: 286.3592 deg
Eccentricity: 0.0015118
Arg of perigee: 243.9064 deg
```

Mean anomaly: 116.0542 deg
Mean motion: 13.84715671 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 31926
Checksum: 327

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94143.01618494
Element set: 290
Inclination: 82.5416 deg
RA of node: 341.5014 deg
Eccentricity: 0.0016793
Arg of perigee: 330.5698 deg
Mean anomaly: 29.4471 deg
Mean motion: 13.16967217 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 27994
Checksum: 314

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94145.48219929
Element set: 638
Inclination: 99.1709 deg
RA of node: 133.8378 deg
Eccentricity: 0.0011171
Arg of perigee: 193.0002 deg
Mean anomaly: 167.0881 deg
Mean motion: 14.12988268 rev/day
Decay rate: 1.24e-06 rev/day^2
Epoch rev: 29201
Checksum: 310

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94143.07013368
Element set: 291
Inclination: 82.5194 deg
RA of node: 163.9460 deg
Eccentricity: 0.0013346
Arg of perigee: 304.0434 deg
Mean anomaly: 55.9451 deg
Mean motion: 13.84365026 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 26421
Checksum: 294

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94145.83435935

Element set: 56
Inclination: 82.5502 deg
RA of node: 285.4311 deg
Eccentricity: 0.0006155
Arg of perigee: 2.9778 deg
Mean anomaly: 357.1381 deg
Mean motion: 13.04403482 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 21998
Checksum: 291

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94144.23310848
Element set: 796
Inclination: 82.5464 deg
RA of node: 227.4882 deg
Eccentricity: 0.0014940
Arg of perigee: 209.3110 deg
Mean anomaly: 150.7229 deg
Mean motion: 13.84188048 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 19730
Checksum: 304

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94145.55435241
Element set: 977
Inclination: 98.8363 deg
RA of node: 166.4070 deg
Eccentricity: 0.0016564
Arg of perigee: 71.8115 deg
Mean anomaly: 288.4852 deg
Mean motion: 14.01342516 rev/day
Decay rate: 4.20e-06 rev/day^2
Epoch rev: 19053
Checksum: 307

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94144.51734142
Element set: 804
Inclination: 82.5263 deg
RA of node: 164.8146 deg
Eccentricity: 0.0014540
Arg of perigee: 108.8861 deg
Mean anomaly: 251.3875 deg
Mean motion: 13.83581698 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 18448

Checksum: 314

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94144.15367579
Element set: 702
Inclination: 82.5428 deg
RA of node: 186.5830 deg
Eccentricity: 0.0011566
Arg of perigee: 247.0250 deg
Mean anomaly: 112.9658 deg
Mean motion: 13.16462510 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14819
Checksum: 290

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94145.54361794
Element set: 41
Inclination: 98.6178 deg
RA of node: 173.8178 deg
Eccentricity: 0.0012251
Arg of perigee: 306.5962 deg
Mean anomaly: 53.4089 deg
Mean motion: 14.22408529 rev/day
Decay rate: 1.68e-06 rev/day^2
Epoch rev: 15731
Checksum: 308

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94144.04747976
Element set: 711
Inclination: 82.5512 deg
RA of node: 133.7949 deg
Eccentricity: 0.0011535
Arg of perigee: 261.0292 deg
Mean anomaly: 98.9519 deg
Mean motion: 13.16830410 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13328
Checksum: 300

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94144.27606260
Element set: 304
Inclination: 82.5490 deg
RA of node: 225.3784 deg
Eccentricity: 0.0021246

```
Arg of perigee: 296.1592 deg
Mean anomaly: 63.7370 deg
Mean motion: 13.83007284 rev/day
Decay rate: 7.0e-07 rev/day^2
Epoch rev: 3678
Checksum: 296

/EX
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777. ORBS$147.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 15:32:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-147.m.1994@ampr.org>
Source record: 27433
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-147.M
Orbital Elements 147.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX May 27, 1994
BID: $ORBS-147.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94144.20009399
Element set: 286
Inclination: 98.6480 deg
RA of node: 220.3002 deg
Eccentricity: 0.0009356
Arg of perigee: 270.1364 deg
Mean anomaly: 89.8754 deg
Mean motion: 14.28025735 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 3427
Checksum: 293

Satellite: MIR
Catalog number: 16609
Epoch time: 94145.46651570
Element set: 622
Inclination: 51.6468 deg
RA of node: 299.9796 deg
Eccentricity: 0.0001400
Arg of perigee: 332.0137 deg
Mean anomaly: 28.0779 deg
Mean motion: 15.56191452 rev/day
Decay rate: 5.081e-05 rev/day^2
Epoch rev: 47250
Checksum: 306

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94146.19060479
Element set: 490
Inclination: 28.4695 deg
RA of node: 17.2699 deg
Eccentricity: 0.0006309
Arg of perigee: 215.0252 deg
```

Mean anomaly: 144.9918 deg
Mean motion: 14.90611648 rev/day
Decay rate: 6.55e-06 rev/day^2
Epoch rev: 2610
Checksum: 301

Satellite: GRO
Catalog number: 21225
Epoch time: 94144.05337500
Element set: 101
Inclination: 28.4615 deg
RA of node: 39.6619 deg
Eccentricity: 0.0003265
Arg of perigee: 301.0259 deg
Mean anomaly: 59.0006 deg
Mean motion: 15.40837905 rev/day
Decay rate: 3.015e-05 rev/day^2
Epoch rev: 5321
Checksum: 245

Satellite: UARS
Catalog number: 21701
Epoch time: 94145.80037151
Element set: 527
Inclination: 56.9863 deg
RA of node: 248.7751 deg
Eccentricity: 0.0005576
Arg of perigee: 100.4698 deg
Mean anomaly: 259.6958 deg
Mean motion: 14.96600504 rev/day
Decay rate: 2.233e-05 rev/day^2
Epoch rev: 14758
Checksum: 317

/EX

778. ORBS$147.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 15:33:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-147.n.1994@ampr.org>
Source record: 27435
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-147.N
2Line Orbital Elements 147.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX May 27, 1994
BID: $ORBS-147.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94142.44873866 -.00000055 00000-0 10000-3 0 2850
2 14129 27.1282 326.3729 6021350 180.2426 179.1822 2.05879809 82258
UO-11
1 14781U 84021B 94143.03061883 .00000276 00000-0 54717-4 0 6952
2 14781 97.7875 158.9341 0012137 356.6640 3.4484 14.69211582546615
RS-10/11
1 18129U 87054A 94143.06202902 .00000033 00000-0 19805-4 0 9046
2 18129 82.9244 347.4186 0013145 90.9237 269.3425 13.72337109346469
AO-13
1 19216U 88051B 94144.40940288 -.00000461 00000-0 10000-4 0 9197
2 19216 57.8423 251.0411 7206867 342.2489 1.9918 2.09725094 45513
FO-20
1 20480U 90013C 94144.43473962 -.00000035 00000-0 -10249-4 0 6927
2 20480 99.0329 300.7480 0541340 33.2966 330.0992 12.83225622201086
AO-21
1 21087U 91006A 94143.50227818 .00000094 00000-0 82657-4 0 4730
2 21087 82.9413 160.9779 0035976 150.2606 210.0599 13.74539547166193
RS-12/13
1 21089U 91007A 94144.13470258 .00000037 00000-0 23586-4 0 6950
2 21089 82.9224 29.2888 0029039 172.4887 187.6707 13.74040914165344
ARSENE
1 22654U 93031B 94146.03306133 -.00000126 00000-0 00000 0 0 2608
2 22654 1.8166 100.7777 2920956 181.5514 176.6819 1.42202574 881
UO-14
1 20437U 90005B 94144.22276841 .00000025 00000-0 26693-4 0 9979
2 20437 98.5880 229.3217 0010181 263.8728 96.1295 14.29843487226168
AO-16
1 20439U 90005D 94144.20928715 .00000020 00000-0 24847-4 0 7964
```

```
2 20439 98.5965 230.5154 0010403 264.3951 95.6036 14.29897339226172
DO-17
1 20440U 90005E 94144.16596132 .00000045 00000-0 34314-4 0 7962
2 20440 98.5981 230.7887 0010560 263.4989 96.4992 14.30037037226186
WO-18
1 20441U 90005F 94144.21082933 .00000033 00000-0 29788-4 0 7986
2 20441 98.5971 230.8353 0011035 263.3967 96.5956 14.30011373226195
LO-19
1 20442U 90005G 94144.19061234 .00000040 00000-0 32455-4 0 7955
2 20442 98.5977 231.0663 0011451 263.1040 96.8842 14.30107216226202
UO-22
1 21575U 91050B 94144.18192998 .00000065 00000-0 36633-4 0 4995
2 21575 98.4364 219.1638 0008301 8.5029 351.6298 14.36915556149634
KO-23
1 22077U 92052B 94144.52572252 -.00000037 00000-0 10000-3 0 3942
2 22077 66.0839 329.5255 0013803 293.2557 66.7013 12.86286047 83740
AO-27
1 22825U 93061C 94144.19661163 .00000028 00000-0 29274-4 0 2938
2 22825 98.6515 220.2413 0008078 284.8036 75.2246 14.27623773 34266
IO-26
1 22826U 93061D 94144.24944208 .00000023 00000-0 27369-4 0 2937
2 22826 98.6505 220.3266 0008712 287.1330 72.8895 14.27727519 34278
KO-25
1 22830U 93061H 94144.19534348 .00000045 00000-0 35671-4 0 2980
2 22830 98.5540 217.7814 0010495 247.7152 112.2919 14.28053943 34275
NOAA-9
1 15427U 84123A 94145.66353036 .00000089 00000-0 71518-4 0 8185
2 15427 99.0554 195.8888 0014172 285.4305 74.5298 14.13617128487167
NOAA-10
1 16969U 86073A 94145.47609782 .00000081 00000-0 52633-4 0 7171
2 16969 98.5093 155.1720 0014363 38.5155 321.7045 14.24886079399374
MET-2/17
1 18820U 88005A 94145.83885770 .00000051 00000-0 32213-4 0 2948
2 18820 82.5389 286.3592 0015118 243.9064 116.0542 13.84715671319268
MET-3/2
1 19336U 88064A 94143.01618494 .00000051 00000-0 10000-3 0 2906
2 19336 82.5416 341.5014 0016793 330.5698 29.4471 13.16967217279949
NOAA-11
1 19531U 88089A 94145.48219929 .00000124 00000-0 91672-4 0 6385
2 19531 99.1709 133.8378 0011171 193.0002 167.0881 14.12988268292019
MET-2/18
1 19851U 89018A 94143.07013368 .00000048 00000-0 30037-4 0 2913
2 19851 82.5194 163.9460 0013346 304.0434 55.9451 13.84365026264211
MET-3/3
1 20305U 89086A 94145.83435935 .00000044 00000-0 10000-3 0 560
2 20305 82.5502 285.4311 0006155 2.9778 357.1381 13.04403482219984
MET-2/19
1 20670U 90057A 94144.23310848 .00000024 00000-0 79036-5 0 7968
2 20670 82.5464 227.4882 0014940 209.3110 150.7229 13.84188048197304
FY-1/2
```

```
1 20788U 90081A 94145.55435241 .00000420 00000-0 30638-3 0 9770
2 20788 98.8363 166.4070 0016564 71.8115 288.4852 14.01342516190535
MET-2/20
1 20826U 90086A 94144.51734142 .00000055 00000-0 36682-4 0 8044
2 20826 82.5263 164.8146 0014540 108.8861 251.3875 13.83581698184480
MET-3/4
1 21232U 91030A 94144.15367579 .00000050 00000-0 10000-3 0 7029
2 21232 82.5428 186.5830 0011566 247.0250 112.9658 13.16462510148195
NOAA-12
1 21263U 91032A 94145.54361794 .00000168 00000-0 94974-4 0 411
2 21263 98.6178 173.8178 0012251 306.5962 53.4089 14.22408529157315
MET-3/5
1 21655U 91056A 94144.04747976 .00000051 00000-0 10000-3 0 7118
2 21655 82.5512 133.7949 0011535 261.0292 98.9519 13.16830410133282
MET-2/21
1 22782U 93055A 94144.27606260 .00000070 00000-0 50433-4 0 3040
2 22782 82.5490 225.3784 0021246 296.1592 63.7370 13.83007284 36787
POSAT
1 22829U 93061G 94144.20009399 .00000042 00000-0 34857-4 0 2862
2 22829 98.6480 220.3002 0009356 270.1364 89.8754 14.28025735 34279
MIR
1 16609U 86017A 94145.46651570 .00005081 00000-0 77965-4 0 6226
2 16609 51.6468 299.9796 0001400 332.0137 28.0779 15.56191452472509
HUBBLE
1 20580U 90037B 94146.19060479 .00000655 00000-0 50142-4 0 4902
2 20580 28.4695 17.2699 0006309 215.0252 144.9918 14.90611648 26105
GRO
1 21225U 91027B 94144.05337500 .00003015 00000-0 65153-4 0 1014
2 21225 28.4615 39.6619 0003265 301.0259 59.0006 15.40837905 53213
UARS
1 21701U 91063B 94145.80037151 .00002233 00000-0 21537-3 0 5276
2 21701 56.9863 248.7751 0005576 100.4698 259.6958 14.96600504147589
/EX
```

779. * SpaceNews 31-May-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-05-27 19:17:59 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0531.1994@ampr.org>
Source record: 27434
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0531
* SpaceNews 31-May-94 *

BID: $SPC0531

=========
SpaceNews
=========

MONDAY MAY 31, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* DOVE STATUS *
===============
KA3AFY copied the following packet frame from DOVE-OSCAR-17 on 24-May-94:

DOVE-1>BRAMST [05/23/94 22:29:58]:
5/23/94
Software loading in progress
S-band is off
DOVE Command Team (WD0E)

At 5/25/94 0525Z DOVE controllers loaded and executed test software designed to assure the operation of the voice module after several months of dormancy. A brief test of the voice capability generated only garbled voice, so it was turned off. They are investigating possible causes, and at this point believe it is a software problem, not hardware.

For the next few days DOVE may be in various modes as controllers continue testing and/or loading new software. The S-band transmitter will remain off. Telemetry reports are not needed at this time.

[Info via Jim White]

* LUSAT-1 STATUS REPORT *
=========================
Controllers report that LUSAT-1 appears healthy after experiencing an OBC software crash. The software load was performed as part of the recovery effort was intentionally stopped after the second module was loaded and turned on. The next step of the recovery will involve continuing with the satellite's deep tests.

The satellite is sending telemetry on 437.125 MHz and it's digipeater is turned on. The BBS, however, is unavailable for use since the BBS software is NOT loaded on the satellite. The BBS will not be operational for the

next 3 weeks (approx.).

Those who send LUSAT-1 overseas telemetry reports (in raw format) will receive a special certificate for their collaboration. The telemetry reports must be sent via the Internet to <lu8dyf@asarin.org.ar> or via packet radio to LU8DYF @ LU8DYF.BA.ARG.SOAM or via satellite to LU8DYF @ any-active-satellite.

LUSAT controllers would like to thank LU8DYF and all the other stations who helped in the LUSAT-1 recovery, including: LU1DBC, LU1EXC, LU1FYZ, LU2BDT, LU2FHE, LU3AGY, LU4AGC, LU4FIO, LU6DYD, LU7ABF, LU7AKC, LU7DSU, LU7XAC, LU8ENU and LW1EEO.

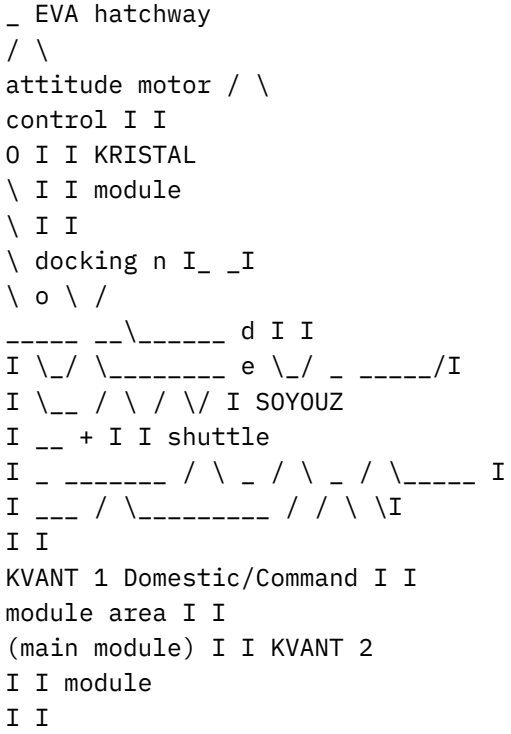
[Info via Eduardo Sweet, LU7AKC of the LUSAT-1 recovery team]

* SpaceNews AVAILABILITY *
==========
Steve Diggs, KB4ZTN, reports that SpaceNews is now available on his "Top Of The Rock BBS" in Lilburn, Georgia, about 15 miles outside of Atlanta. Each issue of SpaceNews is received automatically from the amsat.org server via the Internet, saved as an ASCII file, named as the bulletin ID with a .TXT extension, and posted as a new upload.

The telephone number of the Top Of The Rock BBS is (404) 921-0315.

* MIR DIAGRAM *
==========
The following graphic depicting the structure of the Mir space station is provided by Jean-Claude, FB1RCI:

MIR complex: ex-CCCP/Russian space station (Launch 1986) 90 tons


_ EVA hatchway
/ \
attitude motor / \
control I I
O I I KRISTAL
\ I I module
\ I I
\ docking n I_ _I
\ o \ /
_____ ________ d I I
I _/ ________ e _/ _ _____/I
I __ / \ / \/ I SOYOUZ
I __ + I I shuttle
I _ _______ / \ _ / \ _ / _____ I
I ___ / _________ / / \ \I
I I
KVANT 1 Domestic/Command I I
module area I I
(main module) I I KVANT 2
I I module
I I

```
\__ __/
\/ docking gear
I\_____ _
I \/ \ automatic freighter
I I PROGRESS
I _____ /\ _ /
I/
```

Professional frequencies:
FM 143.625 MHz downlink to the ground control station TSUP (voice)
FM 121.750 MHz -- for Mir extra vehicular activity (voice)
FM 121.750 MHz -- for Soyuz approach for docking (voice)
SSB 922.750 MHz -- for telemetric Mir (few moments)
SSB 166.150 MHz -- for telemetric Progress freighter
Radio amateur frequency:
FM 145.550 MHz up/downlink voice contact (CQ MIR)
FM+AFSK 145.550 MHz -- -- AX.25 packet PMS 1200 bps (R0MIR-1)

* REPORT FROM DL3HRT *
==========
Karsten Hansky, DL3HRT, reports that he is active on RS-10 and monitors the satellite especially during passes in range of North America, but hears few signals. He has worked VE2AYT and K1QPM so far. Both stations come in with good signals (559). Karsten has also worked CN8ST and has heard a TU4-station on the satellite.

DL3HRT recently made a test and heard his own downlink signals using an uplink power of just 300 milliwatts fed into a 9-element yagi. He feels this success should encourage others to try RS-10 Mode A operations.

In other news, Karsten, along with Matthias, DL3HZM, have created a satellite tracking program called "sat09may.exe" that is available via anonymous FTP at igel.physik.th-zwickau.de in the /pub subdirectory, and pilot.njin.net in the /pub/SpaceNews/software subdirectory. An older version is available from the Simtel directory at oak.oakland.edu.

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

KA3AFY KB4ZTN WD5EEV KH6AF K7YHA N8QPO NX0R
Harry Bedard, Jr. Don Fay

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.de.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

780. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-05-28 00:18:33 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.770084313@afit.af.mil>
Source record: 27430
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.info on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (also updated daily) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a eleven-character name.

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

781. Two-Line Orbital Element Sets (TLE402)

Newsgroup: rec.radio.amateur.space
Date: 1994-05-28 00:21:13 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.770084473@afit.af.mil>
Source record: 27427

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #402 -
Alouette 1
1 00424U 62049 94146.84145629 .00000071 00000-0 72604-4 0 9984
2 00424 80.4625 306.0626 0023102 167.6785 192.4932 13.67810804579489
ATS 1
1 02608U 66110A 94145.56563698 -.00000277 00000-0 10000-3 0 8744
2 02608 14.5459 0.6678 0010608 41.4555 324.2727 1.00385440 17248
ATS 3
1 03029U 67111A 94142.71011545 -.00000121 00000-0 10000-3 0 1962
2 03029 14.6263 7.7382 0009515 267.9990 114.7195 1.00273219 97185
Cosmos 398
1 04966U 71016A 94146.65689517 .00067438 64753-5 13856-3 0 2369
2 04966 51.4544 54.3167 1045328 300.3665 49.8347 13.83740630769767
Starlette
1 07646U 75010A 94143.35152135 -.00000117 00000-0 18078-4 0 7842
2 07646 49.8266 251.3586 0206237 254.1024 103.7052 13.82186430974417
LAGEOS
1 08820U 76039A 94143.05083338 .00000014 00000-0 10000-3 0 9982
2 08820 109.8221 126.9926 0044261 290.4951 69.0817 6.38664311165545
ETS-2
1 09852U 77014A 94130.00000000 .00000112 00000-0 10000-3 0 9628
2 09852 12.0881 41.9435 0001849 28.7738 185.2316 1.00010025 9946
GOES 2
1 10061U 77048A 94146.62214690 .00000061 00000-0 00000+0 0 3347
2 10061 11.1584 45.9866 0002021 339.4763 306.8596 1.00259319 6898
IUE
1 10637U 78012A 94146.67330000 -.00000247 00000-0 10000-3 0 43
2 10637 34.5752 95.2261 1313920 35.2217 307.1676 1.00274411 12507
GPS BI-01
1 10684U 78020A 94138.44799225 -.00000037 00000-0 10000-3 0 2711
2 10684 64.6278 46.4000 0062894 163.8298 196.3910 1.98069605104349
```

```
GPS BI-02
1 10893U 78047A 94138.49564427 -.00000013 00000-0 10000-3 0 690
2 10893 63.5638 285.3880 0213879 13.8829 346.6979 2.01627380117472
GOES 3
1 10953U 78062A 94146.24207147 .00000061 00000-0 10000-3 0 3065
2 10953 10.1003 48.7371 0003732 85.9330 22.1881 1.00279141 11502
SeaSat 1
1 10967U 78064A 94143.21452263 .00000015 00000-0 49681-4 0 2928
2 10967 107.9960 50.5457 0002072 273.3564 86.7335 14.37956193832771
GPS BI-03
1 11054U 78093A 94144.47524825 -.00000051 00000-0 10000-3 0 1866
2 11054 63.2487 282.4509 0043935 175.8309 184.1758 1.93505239114052
Nimbus 7
1 11080U 78098A 94147.19786668 -.00000067 00000-0 -22378-4 0 3982
2 11080 99.0551 31.6112 0008786 184.8258 175.2814 13.83733422787174
GPS BI-04
1 11141U 78112A 94141.92182488 -.00000053 00000-0 00000+0 0 8850
2 11141 64.6290 47.4807 0048586 25.1779 335.0780 1.92894889 3275
GPS BI-05
1 11690U 80011A 94142.98149671 -.00000050 00000-0 10000-3 0 7877
2 11690 64.9594 48.0528 0142116 194.9141 164.8000 2.00555728119034
GPS BI-06
1 11783U 80032A 94146.36989950 -.00000042 00000-0 10000-3 0 9740
2 11783 62.6644 278.9535 0210145 29.1786 331.9414 2.03456490103513
GOES 5
1 12472U 81049A 94143.44823221 .00000068 00000-0 10000-3 0 7698
2 12472 6.7751 58.3002 0006166 3.8992 205.4179 1.00311566 5514
Cosmos 1383
1 13301U 82066A 94143.01803114 .00000047 00000-0 37318-4 0 2955
2 13301 82.9286 328.2115 0024068 160.8231 199.3838 13.68055559593980
LandSat 4
1 13367U 82072A 94144.78326483 .00000086 00000-0 29046-4 0 4929
2 13367 98.1800 203.7415 0006881 335.7002 24.3871 14.57124551630653
IRAS
1 13777U 83004A 94146.03361775 .00000362 00000-0 27971-3 0 6005
2 13777 98.9721 337.4490 0013447 21.6636 338.5095 13.99205445248049
Cosmos 1447
1 13916U 83021A 94143.15014409 .00000060 00000-0 46686-4 0 3960
2 13916 82.9447 30.2176 0039437 97.7894 262.7740 13.74309821559897
TDRS 1
1 13969U 83026B 94143.88067324 -.00000199 00000-0 10000-4 0 3052
2 13969 7.6577 51.3547 0006212 62.7160 169.3042 1.00266814 13805
GOES 6
1 14050U 83041A 94146.26270247 -.00000068 00000-0 10000-3 0 2071
2 14050 5.5709 61.3707 0004699 342.4780 184.4228 1.00217999 12569
OSCAR 10
1 14129U 83058B 94142.44873866 -.00000055 00000-0 10000-3 0 2850
2 14129 27.1282 326.3729 6021350 180.2426 179.1822 2.05879809 54280
LandSat 5
1 14780U 84021A 94145.16444180 .00000107 00000-0 33718-4 0 801
```

```
2 14780 98.1621 205.3842 0004833 347.0523 13.0550 14.57131916544123
UoSat 2
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LAGEOS II
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2 22195 52.6413 109.4211 0138880 106.4536 255.1337 6.47294058 37330
GPS BIIA-16
1 22231U 92079A 94145.23229421 .00000052 00000-0 10000-3 0 4069
2 22231 54.7305 199.9055 0037826 290.3738 69.2378 2.00556516 11043
GPS BIIA-17
1 22275U 92089A 94140.38914192 .00000051 00000-0 10000-3 0 4110
2 22275 54.6596 197.6231 0052424 255.7265 103.7744 2.00561550 10352
TDRS 5
1 22314U 93003B 94139.15797001 -.00000278 00000-0 10000-3 0 3977
2 22314 1.0422 72.5851 0003226 333.9275 200.8207 1.00261088 5039
GPS BIIA-18
1 22446U 93007A 94142.45494907 -.00000059 00000-0 10000-3 0 4027
2 22446 54.6836 318.3590 0072333 343.8671 16.0184 2.00574593 9386
Glonass 59
1 22512U 93010A 94146.07164866 .00000017 00000-0 00000+0 0 5822
2 22512 64.9113 109.6899 0008327 207.7747 152.1623 2.13101786 9642
Glonass 60
1 22513U 93010B 94143.19634040 .00000035 00000-0 00000+0 0 5919
2 22513 64.9025 109.8000 0004904 205.3395 154.5873 2.13102176 9772
Glonass 61
1 22514U 93010C 94143.90157280 .00000027 00000-0 00000+0 0 5769
2 22514 64.9155 109.7655 0013285 198.9438 160.9742 2.13101671 9796
ASTRO-D
1 22521U 93011A 94146.36755183 .00000975 00000-0 78282-4 0 2960
2 22521 31.1050 213.0086 0076495 239.6653 119.6379 14.93210515 68831
UFO F1
1 22563U 93015A 94142.52441184 -.00000176 00000-0 10000-3 0 2863
2 22563 26.6949 300.1614 0000316 267.6035 221.8518 0.99253241 8583
GPS BIIA-19
1 22581U 93017A 94145.08733280 -.00000072 00000-0 10000-3 0 3046
2 22581 55.1040 18.5049 0050141 34.2452 326.1263 2.00568374 8492
ARSENE
1 22654U 93031B 94146.03306133 -.00000126 00000-0 00000+0 0 2608
2 22654 1.8166 100.7777 2920956 181.5514 176.6819 1.42202574 881
GPS BIIA-20
1 22657U 93032A 94146.22078370 -.00000076 00000-0 10000-3 0 3152
2 22657 55.1357 18.2762 0059569 206.4608 153.2713 2.00557648 3840
RADCAL
1 22698U 93041A 94143.90736469 .00000108 00000-0 42615-4 0 3006
2 22698 89.5450 310.6456 0089079 267.2457 91.8548 14.21311148 47148
```

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GPS BIIA-21
1 22700U 93042A 94142.69366475 -.00000044 00000-0 10000-3 0 2968
2 22700 54.5340 259.2371 0027259 320.0186 39.7770 2.00552796 6575
NOAA 13
1 22739U 93050A 94146.87086548 .00000073 00000-0 65547-4 0 4435
2 22739 98.9452 91.3443 0009432 176.7603 183.3628 14.10897612 40952
GPS BIIA-22
1 22779U 93054A 94145.27744071 -.00000077 00000-0 10000-3 0 3299
2 22779 54.8111 318.1658 0022421 228.0649 131.7407 2.00570735 5381
Meteor 2-21
1 22782U 93055A 94144.27606260 .00000070 00000-0 50433-4 0 3040
2 22782 82.5490 225.3784 0021246 296.1592 63.7370 13.83007284 36787
UFO F2
1 22787U 93056A 94140.73032126 -.00000065 00000-0 10000-3 0 2787
2 22787 4.8506 323.3999 0073335 131.1329 117.6010 1.00268533 970
SPOT 3
1 22823U 93061A 94144.19494815 .00000169 00000-0 10000-3 0 3117
2 22823 98.7136 219.0363 0000950 72.8889 287.2372 14.20034853 34089
STELLA
1 22824U 93061B 94145.12342479 -.00000030 00000-0 57221-5 0 2935
2 22824 98.6522 221.0595 0005653 280.1855 79.8681 14.27097048 34383
AO-27
1 22825U 93061C 94144.19661163 .00000028 00000-0 29274-4 0 2938
2 22825 98.6515 220.2413 0008078 284.8036 75.2246 14.27623773 34266
IO-26
1 22826U 93061D 94144.24944208 .00000023 00000-0 27369-4 0 2937
2 22826 98.6505 220.3266 0008712 287.1330 72.8895 14.27727519 34278
HEATHSAT
1 22827U 93061E 94133.15992482 .00000044 00000-0 35671-4 0 3460
2 22827 98.6538 209.3230 0008821 305.7656 54.2723 14.27834950 32698
PO-28
1 22829U 93061G 94144.20009399 .00000042 00000-0 34857-4 0 2862
2 22829 98.6480 220.3002 0009356 270.1364 89.8754 14.28025735 34279
KO-25
1 22830U 93061H 94144.19534348 .00000045 00000-0 35671-4 0 2980
2 22830 98.5540 217.7814 0010495 247.7152 112.2919 14.28053943 34275
GPS BIIA-23
1 22877U 93068A 94145.33073144 -.00000037 00000-0 10000-3 0 1234
2 22877 55.1890 79.3615 0032825 287.6501 71.9618 2.00577372 4274
METEOSAT 6
1 22912U 93073B 94145.98528970 -.00000093 00000-0 00000+0 0 880
2 22912 0.9258 268.0338 0001174 222.1404 97.9390 1.00274494 301
HST Array
1 22920U 90037C 94146.72559203 .00006114 00000-0 50936-3 0 1485
2 22920 28.4733 5.8177 0002077 16.0173 344.0305 14.96707252 26275
Soyuz TM-18
1 22957U 94001A 94146.75080520 -.00003612 00000-0 -43731-4 0 1358
2 22957 51.6484 293.5628 0001117 338.3137 21.5436 15.56195376 21628
Meteor 3-6
1 22969U 94003A 94143.84595407 .00000051 00000-0 10000-3 0 662
```

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2 22969 82.5615 73.4342 0014854 331.3758 28.6639 13.16720902 15643
TUBSAT-B
1 22970U 94003B 94141.78525039 .00000013 00000-0 74371-6 0 559
2 22970 82.5590 74.8697 0016343 334.0782 25.9531 13.16819818 15373
1994004C
1 22987U 94004C 94098.46584220 -.00000666 00000-0 00000+0 0 74
2 22987 66.5360 59.3960 9045772 202.2990 31.7820 0.46869300 14
ODERACS A
1 22990U 94006B 94145.78830869 .00070127 12049-4 27246-3 0 849
2 22990 56.9846 69.8828 0022497 110.6981 249.6954 15.87054279 16614
ODERACS B
1 22991U 94006C 94146.76177728 .00065229 11802-4 25933-3 0 841
2 22991 56.9845 65.7147 0020364 110.6219 249.7050 15.86733370 16767
ODERACS E
1 22994U 94006F 94145.90769090 .00029170 00000-0 15496-3 0 738
2 22994 56.9843 71.9679 0019865 108.6063 251.7144 15.80069016 16596
ODERACS F
1 22995U 94006G 94146.16174828 .00029968 00000-0 15829-3 0 888
2 22995 56.9846 70.8212 0020387 110.5554 249.7710 15.80163631 16638
BREMSAT
1 22998U 94006H 94146.16712800 .00032255 00000-0 17739-3 0 705
2 22998 56.9887 71.5600 0016476 116.4748 243.8015 15.79342397 16470
GPS BIIA-24
1 23027U 94016A 94144.40952222 -.00000070 00000-0 00000+0 0 529
2 23027 54.9589 20.4448 0061429 191.3492 168.5472 2.00558249 1569
SEDS 2
1 23028U 94016B 94128.53971118 .13369896 -21752-5 25228-3 0 906
2 23028 32.3548 293.3548 0005633 117.2655 243.1962 16.47311643 9439
ProgressM22
1 23035U 94019A 94142.89782412 .00008777 00000-0 12977-3 0 750
2 23035 51.6467 312.8278 0001134 313.6099 46.5037 15.56163987 9640
Glonass 62
1 23043U 94021A 94143.09871874 -.00000032 00000-0 00000+0 0 528
2 23043 64.8044 350.2417 0005558 173.5780 186.4792 2.13103013 894
Glonass 63
1 23044U 94021B 94143.45088404 -.00000034 00000-0 00000+0 0 339
2 23044 64.8026 350.2340 0027843 201.5514 158.3691 2.13102861 906
Glonass 64?
1 23045U 94021C 94143.09642227 -.00000032 00000-0 00000+0 0 359
2 23045 64.8090 350.2541 0007063 194.9055 165.1247 2.13120083 895
GOES 8
1 23051U 94022A 94144.00000000 -.00000187 00000-0 00000+0 0 1000
2 23051 0.4288 0.0009 0034482 315.1509 195.2754 1.00280535 06
1994023F
1 23094U 94023F 94143.88611662 -.00001119 00000-0 -10329-2 0 302
2 23094 70.9882 318.3523 0201908 26.8007 334.3361 13.71589636 4211
Cosmos 2280
1 23095U 94025A 94146.90622920 .00065548 54639-5 11455-3 0 623
2 23095 70.3789 76.3729 0058632 83.3302 277.4581 15.98828872 4525
SROSS C2
```

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1 23099U 94027A 94146.81368274 .00000181 00000-0 34943-4 0 367
2 23099 46.0515 25.3523 0346646 286.3591 69.9431 14.65273047 3340
1994027B
1 23100U 94027B 94146.00308196 .00000598 00000-0 66685-4 0 188
2 23100 46.0466 29.3849 0346326 282.4253 73.8076 14.64735727 3267
MSTI 2
1 23101U 94028A 94145.51681427 .00004896 00000-0 10115-3 0 255
2 23101 97.1143 340.1333 0011531 224.3250 135.7059 15.46228823 2542
1994028B
1 23102U 94028B 94145.98224608 .00037833 00000-0 53480-3 0 283
2 23102 96.8410 340.1575 0076695 163.9304 196.4427 15.52960950 2627
1994029A
1 23105U 94029A 94143.74480799 .00000338 00000-0 63880-4 0 99
2 23105 81.9595 192.8398 0153625 39.6285 321.6017 14.54212806 592
1994029B
1 23106U 94029B 94143.73597576 .00000080 00000-0 10407-4 0 69
2 23106 81.9596 192.8271 0168686 40.0981 321.2523 14.57428921 594
1994030A
1 23108U 94030A 94146.30510959 -.00000030 00000-0 00000+0 0 103
2 23108 1.3481 276.8355 0035172 46.0564 194.1540 1.03603500 71
1994030D
1 23111U 94030D 94145.39338650 -.00000033 00000-0 00000+0 0 58
2 23111 1.3659 277.8935 0046466 32.9467 230.4251 1.03839217 58
1994018C
1 23112U 94018C 94142.64618471 .27212060 42986-5 18390-3 0 54
2 23112 67.0751 186.6021 0105472 182.8183 203.7022 16.38235360 10599
1994018D
1 23113U 94018D 94142.64635656 -.00001890 59745-5 00000+0 0 43
2 23113 67.1600 186.6307 0073814 160.4677 215.4683 16.24037872 129
1994031A
1 23114U 94031A 94146.75080520 -.00003612 00000-0 -43731-4 0 121
2 23114 51.6484 293.5628 0001117 338.3137 21.5436 15.56195376 711
1994031B
1 23115U 94031B 94144.19925593 .11759745 12608-4 22654-3 0 133
2 23115 51.6509 305.6981 0010103 80.6422 280.3523 16.46522810 344
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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782. LUSAT-1 (LO-19): Actual status

Newsgroup: rec.radio.amateur.space
Date: 1994-05-28 14:16:57 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.Vms2mc1w165w@asarin.org.ar>
Source record: 27428

Official LUSAT-1 Status Report

The satellite LUSAT-1 seems healthy. The control station is actually performing some tests to the satellite.

The satellite is sending telemetry on 437.125 MHz and it's digipeater still turned on.

Overseas stations: If you capture any LUSAT-1 telemetry and send it in raw-mode to the satellite control station, you'll receive a certificate for your collaboration. These telemetry reports can be sent either via packet radio to LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Internet to: lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS is NOT LOADED and it will NOT be operational for the next 3 weeks (approx.).

The LUSAT-1 recovery team want to thanks all the stations that sent LUSAT-1 telemetry data in RAW format.

The overseas stations that are going to receive the Special Award are:

1) Mr. Norimasa Okamoto (JN2LHU) from Gamagori city, Japan.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)

packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

783. ARLK021 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-05-28 20:34:34 UTC
From: w1aw@arrl.org
Message-ID: <$arlk021.1994@ampr.org>
Source record: 27429
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK021
ARLK021 Keplerian data

ZCZC SK88
QST de W1AW
Keplerian Bulletin 21 ARLK021
From ARRL Headquarters
Newington, CT May 28, 1994
To all radio amateurs

SB KEP ARL ARLK021
ARLK021 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94999A 94189.76632148 0.00073311 21920-3 0 22
2 99965 28.4664 14.3253 0003598 331.2635 28.7780 15.90320458 27
AO-10
1 14129U 83058B 94142.44873866 -.00000055 10000-3 0 2859
2 14129 27.1282 326.3729 6021350 180.2426 179.1822 2.05879809 54280
RS-10/11
1 18129U 87054A 94143.06202902 0.00000033 19805-4 0 9045
2 18129 82.9244 347.4186 0013145 90.9237 269.3425 13.72337109346469
UO-11
1 14781U 84021B 94147.04880050 0.00000219 45013-4 0 6968
2 14781 97.7872 162.7641 0011793 344.0205 16.0623 14.69213466547207
RS-12/13
1 21089U 91007A 94144.13470258 0.00000037 23586-4 0 6959
2 21089 82.9224 29.2888 0029039 172.4887 187.6707 13.74040914165344
AO-13
1 19216U 88051B 94147.27035052 -.00000441 10000-4 0 9208
2 19216 57.8366 250.5249 7207923 342.4663 2.0218 2.09724553 14073
UO-14
1 20437U 90005B 94144.22276841 0.00000025 26693-4 0 9978
2 20437 98.5880 229.3217 0010181 263.8728 96.1295 14.29843487226168
AO-16
1 20439U 90005D 94144.20928715 0.00000020 24847-4 0 7963
2 20439 98.5965 230.5154 0010403 264.3951 95.6036 14.29897339226172
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DO-17
1 20440U 90005E 94144.16596132 0.00000045 34314-4 0 7961
2 20440 98.5981 230.7887 0010560 263.4989 96.4992 14.30037037226186
WO-18
1 20441U 90005F 94144.21082933 0.00000033 29788-4 0 7985
2 20441 98.5971 230.8353 0011035 263.3967 96.5956 14.30011373226195
LO-19
1 20442U 90005G 94144.19061234 0.00000040 32455-4 0 7954
2 20442 98.5977 231.0663 0011451 263.1040 96.8842 14.30107216226202
FO-20
1 20480U 90013C 94144.43473962 -.00000035 -10249-4 0 6926
2 20480 99.0329 300.7480 0541340 33.2966 330.0992 12.83225622201086
AO-21
1 21087U 91006A 94146.99633645 0.00000094 82657-4 0 4745
2 21087 82.9417 158.3928 0036111 140.7337 219.6450 13.74540016166678
UO-22
1 21575U 91050B 94144.18192998 0.00000065 36633-4 0 4994
2 21575 98.4364 219.1638 0008301 8.5029 351.6298 14.36915556149634
KO-23
1 22077U 92052B 94144.52572252 -.00000037 10000-3 0 3941
2 22077 66.0839 329.5255 0013803 293.2557 66.7013 12.86286047 83740
KO-25
1 22830U 93061H 94144.19534348 0.00000045 35671-4 0 2989
2 22830 98.5540 217.7814 0010495 247.7152 112.2919 14.28053943 34275
IO-26
1 22826U 93061D 94144.24944208 0.00000023 27369-4 0 2936
2 22826 98.6505 220.3266 0008712 287.1330 72.8895 14.27727519 34278
AO-27
1 22825U 93061C 94144.19661163 0.00000028 29274-4 0 2937
2 22825 98.6515 220.2413 0008078 284.8036 75.2246 14.27623773 34266
PO-28
1 22829U 93061G 94144.20009399 0.00000042 34857-4 0 2861
2 22829 98.6480 220.3002 0009356 270.1364 89.8754 14.28025735 34279
Mir
1 16609U 86017A 94147.26457637 0.00004646 71844-4 0 6241
2 16609 51.6477 290.9923 0001594 334.7802 25.3132 15.56209705472788

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
May 31, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

784. V4.2b of OH5IY's MS S/W

Newsgroup: rec.radio.amateur.space
Date: 1994-05-29 22:59:48 UTC
From: jsi@vipunen.hut.fi
Message-ID: <2sb6p4$nj6@nntp.hut.fi>
Source record: 27438

V4.2b of OH5IY's meteor scatter software is available at ftp.funet.fi:
/pub/ham/vhf-work/mssof42b.zip

A bug found in transmit mode of v4.2 has been fixed in v4.2b (The program
moved to "calls only" when moving from "report" to "R report" stage. This
can be overcomed in v4.2 by using the "text input" (F7) at this stage).

V4.2b contains also msdata files of this year's April Lyrids and Eta Aquarids
meteor showers.

--
Jukka OH6DD jsi@hut.fi

785. APT-Satellites: Report May 28,1994

Newsgroup: rec.radio.amateur.space
Date: 1994-05-30 07:17:36 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-300594070906@129.26.163.253>
Source record: 27439

```
Observed at station 50.7 NLat, 7.1 ELon, MAY 28, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On
Meteor 3-5: APT 137.85 *OFF*

VHF-conflict NOAA-10/NOAA-12 continues, N-10 APT is off.
Meteor 3-5 APT is off too. APT-frequency of Meteor 2-21
changed from 137.40 MHz to 137.85 MHz, but the signal is
weak as always.
As Meteor 3-5 is off, old NOAA-9 now is the best source
for good vis-images.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
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786. Re: Gear for starting satellite station

Newsgroup: rec.radio.amateur.space
Date: 1994-05-30 07:23:49 UTC
From: dbraun@ilx049.iil.intel.com
Message-ID: <2sc4a5INNnb8@ilx018.iil.intel.com>
Source record: 27440

In article <2978870298.0.wk02593@worldlink.com>, "Walter K. Daniel KE3HP"
<wk02593@worldlink.com> writes:
|> Here are two approaches for starting a satellite station based on my
|> experience of the past few years.

Thanks for the posting. One thing I was wondering:

Is it worthwhile to have 70cm CW/SSB transmit capability, or
is a 70cm receive converter suffcient? I know that you can
work AO-13 with the 70cm uplink, but that satellite won't be
around much longer, and I don't know which other satellites
are actually used in the "70cm up - 2M down" analog mode.

Doug Braun Intel Israel, Ltd. M/S: IDC-42 (new mailstop!)
Tel: 011-972-4-655069 dbraun@inside.intel.com

"Partly as a reaction against the increasingly grubby image of
punk and partly because of Paul Weller of The Jam's enthusiasm
for sharp 60's beat styles, 1979 wittnessed a mod revival.
Largely local to London, this consisted principally of swarms
of aggressive young mods parading down Caranaby Street (once
the home of 60's fashion but now a tourist trap) wearing
period parkas decorated with mod insignia, looking for
trouble."

787. RS10 trans-Atlantic contacts.

Newsgroup: rec.radio.amateur.space
Date: 1994-05-30 18:20:18 UTC
From: "S. Badessi" <SBADESSI@ESTEC.BITNET>
Message-ID: <94150.182018SBADESSI@ESTEC.BITNET>
Source record: 27445

Is there anybody on the other side of the ocean, interested in
trying RS10 link with this side? I am available for skeds. I can
hear my signals but it looks there is not too much people trying.

Contact by e-mail: sbadessi@vmprofs.estec.esa.nl

73's de PA3FWP/I0WTD
Stefano Badessi (I0WTD, PA3FWP)
European Space Research and Technology Centre
PI9ESA - ESTEC Radio Club
sbadessi@estec.esa.nl
_____ " In Maxwell we trust...

788. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-05-31 03:00:05 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_770353205@ve6mgs.ampr.org>
Source record: 27441
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

```
Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
```

a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

< Dated information here >

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat

transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

--
Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

789. LUSAT-1 (LO-19): Actual status

Newsgroup: rec.radio.amateur.space
Date: 1994-05-31 12:49:06 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.Jk97mc1w165w@asarin.org.ar>
Source record: 27447

Official LUSAT-1 Status Report

The satellite LUSAT-1 seems healthy. The control station is actually performing some tests to the satellite.

The satellite is sending telemetry on 437.125 MHz and it's digipeater still turned on.

Overseas stations: If you capture any LUSAT-1 telemetry and send it in raw-mode to the satellite control station, you'll receive a certificate for your collaboration. These telemetry reports can be sent either via packet radio to LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Internet to: lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS is NOT LOADED and it will NOT be operational for the next 2 weeks (approx.).

The LUSAT-1 recovery team want to thanks all the stations that sent LUSAT-1 telemetry data in RAW format.

The overseas stations that are going to receive the Special Award are:

1) Mr. Norimasa Okamoto (JN2LHU) from Gamagori city, Japan.
2) Mr. Bent Bagger (OZ6BL+OZ7SAT) from Denmark.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)

packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

790. SAREX School Sked Info, Pls

Newsgroup: rec.radio.amateur.space
Date: 1994-05-31 15:57:43 UTC
From: rapw20@email.sps.mot.com
Message-ID: <1994May31.155743.18422@newsgate.sps.mot.com>
Source record: 27442

One of the local schools has asked our club to help them apply for a SAREX sked and then to help with the actual contact, assuming it's granted. Apparently, one of the crew members is the uncle of a couple of the students at the school. I'm not sure at the moment exactly which shuttle mission they're interested in but I think it's early next year. We have the application and there shouldn't be any problems with technical expertise but what else should they (the school) send in with the application? I would think some kind of proposal that addresses how they intend to fit it in with the curriculum would be in order. Can anyone offer any advice on how to proceed with this?

I'd be interested to hear from anyone who has participated in a SAREX school sked. Any info (logistical, technical, etc.) will be appreciated.

Thanks & 73... Mark AA7TA

791. DSP opinions needed

Newsgroup: rec.radio.amateur.space
Date: 1994-05-31 17:55:40 UTC
From: "John L. Schweiger" <lurker@umich.edu>
Message-ID: <2sftms$eq6@lastactionhero.rs.itd.umich.edu>
Source record: 27443

I'm considering the purchase of either a DSP-12 or AEA-2232 and would very much appreciate opinions, advice or suggestions about either unit. This will be used for mostly sats but some regular packet will be included. E-mail all replies to "lurker@umich.edu" and thanks for the help.

792. SAREX SCHOOL SKED INF

Newsgroup: rec.radio.amateur.space
Date: 1994-05-31 23:29:47 UTC
From: kn4aq.gary@mms.raleigh.nc.us
Message-ID: <9405312329.0X0BJ00@mms.raleigh.nc.us>
Source record: 27449

Ne> One of the local schools has asked our club to help them apply for a
Ne> SAREX sked ...

Ne> I would think some kind of proposal that addresses how they intend
to fit it in with the curriculum would be in order. Can anyone offer
any advice on how to proceed with this?

Ne> I'd be interested to hear from anyone who has participated in a SAREX
Ne> school sked. Any info (logistical, technical, etc.) will be
Ne> appreciated.
Ne> Thanks & 73... Mark AA7TA

Hi, Mark. I helped the Raleigh Amateur Radio Society with a successful
SAREX contact in '92. In our application we pointed out that we had
already made one SAREX demonstration to the school, without a scheduled
contact. I've seen other schools try this before applying. (The attempt
was not successful -- we didn't even hear the shuttle, but that didn't
matter.)

We maximized the number of students exposed by setting up stations at
several schools, linking them together by repeater. The entire contact
was also broadcast on the local repeater, and monitored in a dozen more
schools, and countless offices.

And we promised a big publicity effort (my job). That was very successful,
with a live telecast on the local FOX affiliate, and two nights of
coverage on the news of the other market stations, plus lots of radio
news and newspaper coverage. I generated several press releases that I
faxed to the media, but it was the followup phone calls that got their
attention. Once they realized the potential of the story, they were
eager to cover it.

Our "earth" station was a good OSCAR-type satellite station, with 400
watts RF out to a circularly polarized, steerable antenna. The antenna
was important. The power was overkill. The 5-watt signal from the
shuttle was "pegging the needle" for most of the pass.

The first and last minutes of signal were distorted by doppler effect.
We were late in recognizing and compensating for that. Our contact
lasted 8 minutes... almost horizon-to-horizon. We had 4 kids, and each
got to ask at least 4 questions.

Before and after the contact, our "control station" on the repeater
described what we were doing, and what people could expect to hear.

I have a professionally produced videotape of both our "dry run" practice
exercise, and the contact itself. If you would like a copy, I'll make you

one for the cost of duplication and handling ($12). It will be a good way to see how it happens (at least here in Raleigh) and spur interest with club members in your area.

73, and good luck with your application (and contact!),

Gary Pearce KN4AQ
4400 Bleeker Ct.
Raleigh, NC 27606

___ Blue Wave/QWK v2.12

793. ** Venus Unveiled ** Free Pub. Lecture

Newsgroup: rec.radio.amateur.space
Date: 1994-05-31 23:38:52 UTC
From: abdilla@rmit.edu.au
Message-ID: <abdilla-010694093755@131.170.150.91>
Source record: 27444

The Space Association of Australia

presents

Dr. R. Stephen Saunders, Senior Research Scientist
Jet Propulsion Laboratory

who will deliver a free public lecture
called

**** VENUS UNVEILED ****

Dr. Saunders is the Project Scientist for MAGELLAN -
the NASA spacecraft that spent 3 years orbiting Venus
performing the first detailed radar survey of the surface
of Earth's cloud-shrouded sister-planet

DATE: Wednesday, 15 June, 1994

TIME: 7:45 pm

VENUE: Earth Sciences Lecture Theatre
Earth Sciences Building
Univerity of Melbourne
Cnr. of Swanston & Elgin Streets

Admission: Free - no booking neccessary

For further information contact the author of this post or
John Coleman on: (03) 729 5538

This event is *not* sponsored by either the Centre for Design or RMIT

+--+
Michael Abdilla - Information Services Manager
Centre for Design at RMIT

GPO Box 2476V

Melbourne | Ph: +61 3 6602237

Victoria 3001 | Fax: +61 3 6632891

Australia | E-mail: abdilla@rmit.edu.au

794. CUBA TO BE ACTIVE ON OSCAR 13

Newsgroup: rec.radio.amateur.space
Date: 1994-06-01 00:50:59 UTC
From: Bill Tynan <70323.2750@CompuServe.COM>
Message-ID: <$ans-151-01.1994@ampr.org>
Source record: 27448
Cross-posted to: rec.radio.amateur.space,rec.radio.info

HR AMSAT NEWS SERVICE BULLETIN 151.01 FROM AMSAT HQ
SILVER SPRING, MD MAY 31,1994
TO ALL RADIO AMATEURS BT
BID: $ANS-151-01

CUBA TO BE ACTIVE ON OSCAR 13

Two special Cuban stations are planning to be active on OSCAR 13 beginning Thursday June 2 for about a week. Calls will be CO0FRC operating from Grid Square EL83 and CO0BGG operating from EL93. Both of these stations, along with CO0EGZ in EL82, will also be active during ARRL VHF QSO Party which will be held June 4 through 6.
/EX

795. This week's AMSAT Bulletins???

Newsgroup: rec.radio.amateur.space
Date: 1994-06-01 12:05:06 UTC
From: tstader@aol.com
Message-ID: <2shthi$q9j@search01.news.aol.com>
Source record: 27446

I have not seen this week's AMSAT Bulletins... did anyone else get them? I was on the distribution list but never got them that way... so hoping they would show up here. The AMSAT distributed KEPs have hit the net... but not the bulletins.

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Macintosh Amateur Radio Software List Maintainer
Internet: tstader@aol.com (e-mail) or
p00489@psilink.com (binaries/files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM
ka8scp@ka8scp.ampr.org [44.56.4.82] Mac
[44.56.4.120] DOS Clone

796. Orbital Elements for the Moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-01 18:30:04 UTC
From: debaker@bnr.ca
Message-ID: <2sik3c$6ko@crchh7b0.bnr.ca>
Source record: 27451

Greetings,

I was just wondering if there are orbital elements for the moon
that could be entered into a satellite tracking program. Two line
NASA format would be best. While we're at it, how about elements
for the sun?

Thanks,

+---+
| David E. Baker Internet: debaker@bnr.ca (Richardson, TX, USA) |
| Callsign: AB5PI Amateur Packet: AB5PI@N5AUX.#DFW.TX.USA.NA |
| My opinions do not necessarily reflect the opinions of my employer |
+---+

797. Oscar antennas?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-01 20:35:39 UTC
From: blaknite@pipeline.com
Message-ID: <2sirer$gpv@pipeline.com>
Source record: 27450

I was thinking about getting Cushcrafts AOP bundle oscar antennas. It seems like a good deal at $250. Can anyone give me some ideas about this? Thanks...

Noah
blaknite@pipeline.com

798. Re: OSCAR ANTENNAS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-01 20:39:48 UTC
From: ledlow@rapnet.sanders.lockheed.com
Message-ID: <1994Jun1.153948.1@rapnet.sanders.lockheed.com>
Source record: 27455

In article <c9Hymc1w165w@barf80.nshore.org>, wb8k@barf80.nshore.org (Dennis jakubisin) writes:
> STILL LOOKING FOR INFO, COMMENTS, SUCCESS/HORROR STORIES CONCERNING
> OSCAR ANTENNAS.. WHO IS USING WHAT AND WHY.. WHAT'S WORKING
> KLM? M-SQUARED? HY-GAIN ETC ETC..
> ** ALSO LOOKING FOR AGOOD (CHEAP) SOURCE OF FIBERGLASS TUBING 2"0D .25
> WALL IN 5 TO 12 FT LENGTHS...
> I'M IN THE PROCESS OF REVAMPING THE MODE B AND S ANTENNA SYSTEM.

I have owned both KLM and M^2. KLM is a very good quality antenna. This past weekend I put up some M^2 antennas for Mode B. I think the materials are very good quality, but only time will tell about the durability of the machanical design. Also, I have an SWR problem, which I *THINK* is related to some inherited Belden 9913 and not the antennas. You can buy a Mode B antenna kit (including 2" fiberglass boom) from Radioware in Mass. Includes 2 M^2 circular pol antennas. One problem: The hardware used to mount the 435 MHz antenna includes a 1.5" U bolt, while the fiberglass mast is 2"! The mounting plate accomodates both 1.5 and 2". I just have to go out and buy a 2" U bolt now.

73 de Larry/NA5E

799. AEA 1232 problem

Newsgroup: rec.radio.amateur.space
Date: 1994-06-02 03:39:59 UTC
From: rdhoughton@vms4.sci.csupomona.edu
Message-ID: <1994Jun1.204000.1@clstcs>
Source record: 27460

I would be interested in hearing from anyone who has sucessfully
gotten the STEP and SCAN commands to work on an AEA DSP-1232
multi-mode controller. I am using a Yeasu FT-736R which expects
the up/dowm freq buttons to go high (+5V) when activated. The AEA unit
is designed to pull the up/down lines to ground. I have built a logic
inverter with a couple of resistors and NPN transistors but I still
can't get the doppler correction signals to work. It's difficult
to test the doppler correction except during a satellite pass. If I
am reading the manual correctly, the SCAN command should pulse the
freq control lines (that is if the SCAN command is implemented on the 1232
unit). By the way, I am using bver. 7.00 ROMs which are supposed to do
doppler correction.

Thanks in advance for any help...

Bob Houghton
KC6LVG

800. Re: Oscar antennas?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-02 14:53:10 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jun2.145310.801@ke4zv.atl.ga.us>
Source record: 27454

In article <2sirer$gpv@pipeline.com> blaknite@pipeline.com (Noah Lehmann-Haupt) writes:
>I was thinking about getting Cushcrafts AOP bundle oscar
>antennas. It seems like a good deal at $250. Can anyone give
>me some ideas about this? Thanks...

I started out with this setup, and I don't recomend it. The two
antennas don't point to the same boresight (patterns aren't
symmetric with the booms), and SWR rises significantly when they
are wet, even from heavy dew. I made a bunch of contacts using
this setup, but switching to KLM antennas made a world of difference.
I'm using the 22C and 40CX now, and am much happier.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

801. Re: OSCAR ANTENNAS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-02 18:09:43 UTC
From: ledlow@rapnet.sanders.lockheed.com
Message-ID: <1994Jun2.130943.1@rapnet.sanders.lockheed.com>
Source record: 27452

To follow up what I said yesterday about M^2 antennas and my problem with SWR on my new Mode B setup:

> ... Also, I have an SWR problem, which I *THINK* is
> related to some inherited Belden 9913 and not the antennas...

It was, in fact, the cable. I replaced the feeds with brand new 9913 equivalent, and the SWR problem went away. Well, I did have to tweak the position of the shorting blocks on the 2m array for best SWR, but that was my assembly error, not the antenna.

> 73 de Larry/NA5E AMSAT #10356

802. Re: Oscar antennas?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-02 18:19:57 UTC
From: ledlow@rapnet.sanders.lockheed.com
Message-ID: <1994Jun2.131957.1@rapnet.sanders.lockheed.com>
Source record: 27453

In article <2sirer$gpv@pipeline.com>,
blaknite@pipeline.com (Noah Lehmann-Haupt) writes:
> I was thinking about getting Cushcrafts AOP bundle oscar
> antennas. It seems like a good deal at $250. Can anyone give
> me some ideas about this? Thanks...

Just my opinion...save your money and buy a better quality antenna
like KLM or M^2. I can almost guarantee you won't be happy with
the Cushcraft and end up buying something else anyway. The satellite
antennas are not their best product by any means, and besides so-so
performance, they may blow apart in the first good wind storm.

73 de Larry/NA5E
> blaknite@pipeline.co

803. LUSAT-1 (LO-19): Actual status

Newsgroup: rec.radio.amateur.space
Date: 1994-06-02 21:09:28 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.H3kBNc1w165w@asarin.org.ar>
Source record: 27456

```
Official LUSAT-1 Status Report

On june 1st 1994, during the 22739th orbit, the CW beacon was turned ON=
. This
operation was done by the control station (Norberto Pennini, LU8DYF) an=
d the
station encharged of the CW beacon (Rub=82n Ferreiro, LU6DYD).

Norberto (LU8DYF), turned OFF the "B" transmitter (437.125 MHz) and tur=
ned ON
the "A" transmitter (437.150 MHz). While this procedure took place, Rub=
=82n
captured some telemetry. When Norberto swapped the transmitters, Rub=82=
n started
to send the PN sequence, encharged to turn ON the CW beacon. After more=
than 9
months, the CW beacon was started again.

On june 2nd 1994, during the 22754th orbit, the CW beacon was turned OF=
F. This
operation was done by Norberto and Rub=82n.
Rub=82n turned OFF the CW beacon and Norberto swapped again the two tra=
nsmitters.
Once again, the CW beacon is OFF and the "B" Raised Cosine PSK transmit=
ter
(437.125 MHz) is ON.

We encourage those stations that have telemetry reports for this period=
to send
them to us for analisys purposes.

Overseas stations: If you capture any LUSAT-1 telemetry and send it in =
raw-mode
to the satellite control station, you'll receive a certificate for your
collaboration. These telemetry reports can be sent either via packet ra=
dio to
LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Inter=
net to:
lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS is NOT=
LOADED
and it will NOT be operational for the next 2 weeks (approx.).

The LUSAT-1 recovery team want to thanks all the stations that sent LUS=
AT-1
```

telemetry data in RAW format.

The overseas stations that are going to receive the Special Award are:

1) Mr. Norimasa Okamoto (JN2LHU) from Gamagori city, Japan.
2) Mr. Bent Bagger (OZ6BL+OZ7SAT) from Denmark.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)

packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

804. Re: Oscar antennas?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 12:24:24 UTC
From: mallick@crd.ge.com
Message-ID: <CqtMGo.4xK@crdnns.crd.ge.com>
Source record: 27458

I used the HyGain Oscar-Link antennas. They seem pretty well constructed
and I made a bunch of contacts through AO-13 running my TenTec 2510 barefoot
(10 watts out).
--
....
John A. Mallick WA1HNL E-mail: mallick@crd.ge.com
GE Corporate Research and Development Phone: (518)-387-7667 (W)
Schenectady, NY 12301 FAX: (518)-387-6560 (W)
....

"Work like hell. Tell everyone everything you know. Close a deal
with a handshake. And have fun." --- "Doc" Edgerton

805. ORBS$154.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 14:22:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-154.o.1994@ampr.org>
Source record: 27613
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-154.O
Orbital Elements 154.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX June 3, 1994
BID: $ORBS-154.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94150.69677441
Element set: 287
Inclination: 27.1154 deg
RA of node: 325.0714 deg
Eccentricity: 0.6022081
Arg of perigee: 182.4311 deg
Mean anomaly: 172.2849 deg
Mean motion: 2.05880205 rev/day
Decay rate: -6.1e-07 rev/day^2
Epoch rev: 8242
Checksum: 277

Satellite: UO-11
Catalog number: 14781
Epoch time: 94151.06697961
Element set: 697
Inclination: 97.7873 deg
RA of node: 166.5950 deg
Eccentricity: 0.0011480
Arg of perigee: 330.9202 deg
Mean anomaly: 29.1364 deg
Mean motion: 14.69214238 rev/day
Decay rate: 1.05e-06 rev/day^2
Epoch rev: 54779
Checksum: 328

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94151.51951043
Element set: 906
Inclination: 82.9242 deg
RA of node: 341.1657 deg
Eccentricity: 0.0013332
Arg of perigee: 71.1063 deg
```

Mean anomaly: 289.1529 deg
Mean motion: 13.72337845 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 34762
Checksum: 295

Satellite: AO-13
Catalog number: 19216
Epoch time: 94147.27035052
Element set: 920
Inclination: 57.8366 deg
RA of node: 250.5249 deg
Eccentricity: 0.7207923
Arg of perigee: 342.4663 deg
Mean anomaly: 2.0218 deg
Mean motion: 2.09724553 rev/day
Decay rate: -4.41e-06 rev/day^2
Epoch rev: 4557
Checksum: 294

Satellite: FO-20
Catalog number: 20480
Epoch time: 94148.87864649
Element set: 693
Inclination: 99.0336 deg
RA of node: 304.3511 deg
Eccentricity: 0.0541298
Arg of perigee: 23.2290 deg
Mean anomaly: 339.2310 deg
Mean motion: 12.83225769 rev/day
Decay rate: -3.3e-07 rev/day^2
Epoch rev: 20165
Checksum: 304

Satellite: AO-21
Catalog number: 21087
Epoch time: 94150.49039325
Element set: 475
Inclination: 82.9417 deg
RA of node: 155.8080 deg
Eccentricity: 0.0036271
Arg of perigee: 131.0991 deg
Mean anomaly: 229.3291 deg
Mean motion: 13.74540326 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16715
Checksum: 299

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94148.13976132

Element set: 696
Inclination: 82.9227 deg
RA of node: 26.3188 deg
Eccentricity: 0.0029245
Arg of perigee: 161.2877 deg
Mean anomaly: 198.9366 deg
Mean motion: 13.74041143 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 16589
Checksum: 334

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94148.14207755
Element set: 261
Inclination: 1.8240 deg
RA of node: 100.0387 deg
Eccentricity: 0.2920689
Arg of perigee: 182.3578 deg
Mean anomaly: 176.3320 deg
Mean motion: 1.42202262 rev/day
Decay rate: -1.30e-06 rev/day^2
Epoch rev: 91
Checksum: 256

/EX

806. ORBS$154.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 14:24:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-154.d.1994@ampr.org>
Source record: 27615
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-154.D
Orbital Elements 154.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX June 3, 1994
BID: $ORBS-154.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94148.77131663
Element set: 998
Inclination: 98.5887 deg
RA of node: 233.8092 deg
Eccentricity: 0.0010120
Arg of perigee: 249.2130 deg
Mean anomaly: 110.7967 deg
Mean motion: 14.29844035 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 22681
Checksum: 313

Satellite: AO-16
Catalog number: 20439
Epoch time: 94148.26783817
Element set: 797
Inclination: 98.5973 deg
RA of node: 234.5240 deg
Eccentricity: 0.0010441
Arg of perigee: 251.8891 deg
Mean anomaly: 108.1154 deg
Mean motion: 14.29897857 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 22675
Checksum: 339

Satellite: DO-17
Catalog number: 20440
Epoch time: 94148.22411695
Element set: 797
Inclination: 98.5984 deg
RA of node: 234.7976 deg
Eccentricity: 0.0010539
Arg of perigee: 250.6532 deg
```

Mean anomaly: 109.3505 deg
Mean motion: 14.30037363 rev/day
Decay rate: 1.9e-07 rev/day^2
Epoch rev: 22676
Checksum: 316

Satellite: WO-18
Catalog number: 20441
Epoch time: 94148.26905745
Element set: 799
Inclination: 98.5983 deg
RA of node: 234.8454 deg
Eccentricity: 0.0011068
Arg of perigee: 251.1899 deg
Mean anomaly: 108.8082 deg
Mean motion: 14.30011720 rev/day
Decay rate: 1.5e-07 rev/day^2
Epoch rev: 22677
Checksum: 319

Satellite: LO-19
Catalog number: 20442
Epoch time: 94148.24856903
Element set: 796
Inclination: 98.5963 deg
RA of node: 235.0753 deg
Eccentricity: 0.0011443
Arg of perigee: 249.3737 deg
Mean anomaly: 110.6220 deg
Mean motion: 14.30107631 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 22678
Checksum: 299

Satellite: UO-22
Catalog number: 21575
Epoch time: 94148.22067990
Element set: 500
Inclination: 98.4361 deg
RA of node: 223.1211 deg
Eccentricity: 0.0008131
Arg of perigee: 357.3213 deg
Mean anomaly: 2.7927 deg
Mean motion: 14.36916027 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 15021
Checksum: 265

Satellite: KO-23
Catalog number: 22077
Epoch time: 94148.87977740

Element set: 395
Inclination: 66.0837 deg
RA of node: 320.4068 deg
Eccentricity: 0.0013878
Arg of perigee: 293.2309 deg
Mean anomaly: 66.7247 deg
Mean motion: 12.86286268 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8430
Checksum: 341

Satellite: AO-27
Catalog number: 22825
Epoch time: 94148.75222038
Element set: 294
Inclination: 98.6520 deg
RA of node: 224.7518 deg
Eccentricity: 0.0007954
Arg of perigee: 270.5496 deg
Mean anomaly: 89.4773 deg
Mean motion: 14.27624265 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 3491
Checksum: 323

Satellite: IO-26
Catalog number: 22826
Epoch time: 94148.66455740
Element set: 294
Inclination: 98.6516 deg
RA of node: 224.6994 deg
Eccentricity: 0.0008492
Arg of perigee: 272.6887 deg
Mean anomaly: 87.3324 deg
Mean motion: 14.27728000 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 3490
Checksum: 332

Satellite: KO-25
Catalog number: 22830
Epoch time: 94148.74959187
Element set: 299
Inclination: 98.5537 deg
RA of node: 222.2416 deg
Eccentricity: 0.0010549
Arg of perigee: 233.7819 deg
Mean anomaly: 126.2388 deg
Mean motion: 14.28054429 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 3492

```
Checksum: 330

/EX
```

807. ORBS$154.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 14:26:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-154.m.1994@ampr.org>
Source record: 27612
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-154.M
Orbital Elements 154.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX June 3, 1994
BID: $ORBS-154.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94148.75442192
Element set: 287
Inclination: 98.6491 deg
RA of node: 224.8119 deg
Eccentricity: 0.0009251
Arg of perigee: 255.4590 deg
Mean anomaly: 104.5565 deg
Mean motion: 14.28026396 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 3492
Checksum: 314

Satellite: MIR
Catalog number: 16609
Epoch time: 94151.24592674
Element set: 629
Inclination: 51.6483 deg
RA of node: 271.0844 deg
Eccentricity: 0.0001970
Arg of perigee: 346.1860 deg
Mean anomaly: 13.9079 deg
Mean motion: 15.56249388 rev/day
Decay rate: 4.896e-05 rev/day^2
Epoch rev: 47340
Checksum: 329

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94152.21663965
Element set: 492
Inclination: 28.4695 deg
RA of node: 338.5655 deg
Eccentricity: 0.0006073
Arg of perigee: 279.9168 deg
```

Mean anomaly: 80.0726 deg
Mean motion: 14.90615418 rev/day
Decay rate: 5.12e-06 rev/day^2
Epoch rev: 2700
Checksum: 304

Satellite: GRO
Catalog number: 21225
Epoch time: 94149.88243731
Element set: 103
Inclination: 28.4617 deg
RA of node: 359.2112 deg
Eccentricity: 0.0003353
Arg of perigee: 5.4958 deg
Mean anomaly: 354.5681 deg
Mean motion: 15.40862011 rev/day
Decay rate: 2.212e-05 rev/day^2
Epoch rev: 5411
Checksum: 261

Satellite: UARS
Catalog number: 21701
Epoch time: 94151.54499032
Element set: 535
Inclination: 56.9959 deg
RA of node: 225.7702 deg
Eccentricity: 0.0005799
Arg of perigee: 111.4559 deg
Mean anomaly: 248.7094 deg
Mean motion: 14.96547438 rev/day
Decay rate: -3.847e-05 rev/day^2
Epoch rev: 14844
Checksum: 341

/EX

808. ORBS$154.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 14:26:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-154.w.1994@ampr.org>
Source record: 27616
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-154.W
Orbital Elements 154.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX June 3, 1994
BID: $ORBS-154.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94152.88306002
Element set: 824
Inclination: 99.0546 deg
RA of node: 203.1942 deg
Eccentricity: 0.0014092
Arg of perigee: 264.1172 deg
Mean anomaly: 95.8393 deg
Mean motion: 14.13619020 rev/day
Decay rate: 1.05e-06 rev/day^2
Epoch rev: 48818
Checksum: 292

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94152.98973369
Element set: 724
Inclination: 98.5103 deg
RA of node: 162.4582 deg
Eccentricity: 0.0013883
Arg of perigee: 18.7855 deg
Mean anomaly: 341.3832 deg
Mean motion: 14.24887402 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 40044
Checksum: 331

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94151.40270693
Element set: 299
Inclination: 82.5390 deg
RA of node: 281.9318 deg
Eccentricity: 0.0015172
Arg of perigee: 226.5925 deg
```

Mean anomaly: 133.3968 deg
Mean motion: 13.84715655 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 32003
Checksum: 309

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94151.52504778
Element set: 292
Inclination: 82.5409 deg
RA of node: 335.4775 deg
Eccentricity: 0.0016378
Arg of perigee: 308.6445 deg
Mean anomaly: 51.3205 deg
Mean motion: 13.16967657 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28106
Checksum: 316

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94152.98817862
Element set: 646
Inclination: 99.1680 deg
RA of node: 141.5287 deg
Eccentricity: 0.0011559
Arg of perigee: 172.0081 deg
Mean anomaly: 188.1276 deg
Mean motion: 14.12989331 rev/day
Decay rate: -2.8e-07 rev/day^2
Epoch rev: 29307
Checksum: 325

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94152.03234819
Element set: 293
Inclination: 82.5169 deg
RA of node: 156.8006 deg
Eccentricity: 0.0012615
Arg of perigee: 274.1559 deg
Mean anomaly: 85.8154 deg
Mean motion: 13.84365558 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 26545
Checksum: 326

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94151.51035704

Element set: 61
Inclination: 82.5526 deg
RA of node: 281.5035 deg
Eccentricity: 0.0006977
Arg of perigee: 342.8814 deg
Mean anomaly: 17.2118 deg
Mean motion: 13.04410247 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22072
Checksum: 257

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94153.19649084
Element set: 798
Inclination: 82.5473 deg
RA of node: 220.3714 deg
Eccentricity: 0.0015262
Arg of perigee: 183.4095 deg
Mean anomaly: 176.6966 deg
Mean motion: 13.84188469 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 19854
Checksum: 343

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94151.55189960
Element set: 982
Inclination: 98.8364 deg
RA of node: 172.2130 deg
Eccentricity: 0.0016497
Arg of perigee: 56.4578 deg
Mean anomaly: 303.8160 deg
Mean motion: 14.01346839 rev/day
Decay rate: 3.54e-06 rev/day^2
Epoch rev: 19137
Checksum: 329

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94149.07330551
Element set: 805
Inclination: 82.5256 deg
RA of node: 161.1899 deg
Eccentricity: 0.0014886
Arg of perigee: 97.4019 deg
Mean anomaly: 262.8836 deg
Mean motion: 13.83582155 rev/day
Decay rate: 6.9e-07 rev/day^2
Epoch rev: 18511

Checksum: 324

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94148.56174644
Element set: 703
Inclination: 82.5425 deg
RA of node: 183.4669 deg
Eccentricity: 0.0011578
Arg of perigee: 234.4922 deg
Mean anomaly: 125.5106 deg
Mean motion: 13.16462790 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14877
Checksum: 303

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94152.99997481
Element set: 49
Inclination: 98.6246 deg
RA of node: 181.1146 deg
Eccentricity: 0.0011965
Arg of perigee: 277.1427 deg
Mean anomaly: 82.8403 deg
Mean motion: 14.22412108 rev/day
Decay rate: 5.45e-06 rev/day^2
Epoch rev: 15837
Checksum: 314

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94148.45432105
Element set: 712
Inclination: 82.5512 deg
RA of node: 130.6819 deg
Eccentricity: 0.0011557
Arg of perigee: 248.1688 deg
Mean anomaly: 111.8208 deg
Mean motion: 13.16830563 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13386
Checksum: 289

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94148.68922043
Element set: 305
Inclination: 82.5491 deg
RA of node: 221.8821 deg
Eccentricity: 0.0021015

```
Arg of perigee: 282.9730 deg
Mean anomaly: 76.9084 deg
Mean motion: 13.83007584 rev/day
Decay rate: 6.3e-07 rev/day^2
Epoch rev: 3739
Checksum: 302

/EX
```

809. ORBS$154.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 14:28:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-154.n.1994@ampr.org>
Source record: 27614
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-154.N
2Line Orbital Elements 154.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX June 3, 1994
BID: $ORBS-154.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94150.69677441 -.00000061 00000-0 10000-3 0 2876
2 14129 27.1154 325.0714 6022081 182.4311 172.2849 2.05880205 82429
UO-11
1 14781U 84021B 94151.06697961 .00000105 00000-0 25653-4 0 6976
2 14781 97.7873 166.5950 0011480 330.9202 29.1364 14.69214238547796
RS-10/11
1 18129U 87054A 94151.51951043 .00000057 00000-0 45799-4 0 9061
2 18129 82.9242 341.1657 0013332 71.1063 289.1529 13.72337845347628
AO-13
1 19216U 88051B 94147.27035052 -.00000441 00000-0 10000-4 0 9209
2 19216 57.8366 250.5249 7207923 342.4663 2.0218 2.09724553 45572
FO-20
1 20480U 90013C 94148.87864649 -.00000033 00000-0 -45188-5 0 6935
2 20480 99.0336 304.3511 0541298 23.2290 339.2310 12.83225769201650
AO-21
1 21087U 91006A 94150.49039325 .00000094 00000-0 82657-4 0 4752
2 21087 82.9417 155.8080 0036271 131.0991 229.3291 13.74540326167154
RS-12/13
1 21089U 91007A 94148.13976132 .00000042 00000-0 27995-4 0 6961
2 21089 82.9227 26.3188 0029245 161.2877 198.9366 13.74041143165893
ARSENE
1 22654U 93031B 94148.14207755 -.00000130 00000-0 00000 0 0 2618
2 22654 1.8240 100.0387 2920689 182.3578 176.3320 1.42202262 918
UO-14
1 20437U 90005B 94148.77131663 .00000026 00000-0 26965-4 0 9989
2 20437 98.5887 233.8092 0010120 249.2130 110.7967 14.29844035226815
AO-16
1 20439U 90005D 94148.26783817 .00000023 00000-0 26004-4 0 7977
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2 20439 98.5973 234.5240 0010441 251.8891 108.1154 14.29897857226757
DO-17
1 20440U 90005E 94148.22411695 .00000019 00000-0 24245-4 0 7977
2 20440 98.5984 234.7976 0010539 250.6532 109.3505 14.30037363226760
WO-18
1 20441U 90005F 94148.26905745 .00000015 00000-0 22857-4 0 7991
2 20441 98.5983 234.8454 0011068 251.1899 108.8082 14.30011720226776
LO-19
1 20442U 90005G 94148.24856903 .00000023 00000-0 25921-4 0 7962
2 20442 98.5963 235.0753 0011443 249.3737 110.6220 14.30107631226780
UO-22
1 21575U 91050B 94148.22067990 .00000036 00000-0 26734-4 0 5009
2 21575 98.4361 223.1211 0008131 357.3213 2.7927 14.36916027150217
KO-23
1 22077U 92052B 94148.87977740 -.00000037 00000-0 10000-3 0 3956
2 22077 66.0837 320.4068 0013878 293.2309 66.7247 12.86286268 84304
AO-27
1 22825U 93061C 94148.75222038 .00000021 00000-0 26231-4 0 2942
2 22825 98.6520 224.7518 0007954 270.5496 89.4773 14.27624265 34912
IO-26
1 22826U 93061D 94148.66455740 .00000025 00000-0 28036-4 0 2940
2 22826 98.6516 224.6994 0008492 272.6887 87.3324 14.27728000 34900
KO-25
1 22830U 93061H 94148.74959187 .00000024 00000-0 27213-4 0 2998
2 22830 98.5537 222.2416 0010549 233.7819 126.2388 14.28054429 34922
NOAA-9
1 15427U 84123A 94152.88306002 .00000105 00000-0 80156-4 0 8242
2 15427 99.0546 203.1942 0014092 264.1172 95.8393 14.13619020488187
NOAA-10
1 16969U 86073A 94152.98973369 .00000058 00000-0 43064-4 0 7240
2 16969 98.5103 162.4582 0013883 18.7855 341.3832 14.24887402400440
MET-2/17
1 18820U 88005A 94151.40270693 .00000024 00000-0 84467-5 0 2994
2 18820 82.5390 281.9318 0015172 226.5925 133.3968 13.84715655320033
MET-3/2
1 19336U 88064A 94151.52504778 .00000051 00000-0 10000-3 0 2922
2 19336 82.5409 335.4775 0016378 308.6445 51.3205 13.16967657281065
NOAA-11
1 19531U 88089A 94152.98817862 -.00000028 00000-0 10000-4 0 6467
2 19531 99.1680 141.5287 0011559 172.0081 188.1276 14.12989331293077
MET-2/18
1 19851U 89018A 94152.03234819 .00000045 00000-0 26819-4 0 2937
2 19851 82.5169 156.8006 0012615 274.1559 85.8154 13.84365558265452
MET-3/3
1 20305U 89086A 94151.51035704 .00000044 00000-0 10000-3 0 618
2 20305 82.5526 281.5035 0006977 342.8814 17.2118 13.04410247220722
MET-2/19
1 20670U 90057A 94153.19649084 .00000040 00000-0 22727-4 0 7984
2 20670 82.5473 220.3714 0015262 183.4095 176.6966 13.84188469198541
FY-1/2
```

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1 20788U 90081A 94151.55189960 .00000354 00000-0 26268-3 0 9827
2 20788 98.8364 172.2130 0016497 56.4578 303.8160 14.01346839191374
MET-2/20
1 20826U 90086A 94149.07330551 .00000069 00000-0 48640-4 0 8059
2 20826 82.5256 161.1899 0014886 97.4019 262.8836 13.83582155185112
MET-3/4
1 21232U 91030A 94148.56174644 .00000050 00000-0 10000-3 0 7038
2 21232 82.5425 183.4669 0011578 234.4922 125.5106 13.16462790148779
NOAA-12
1 21263U 91032A 94152.99997481 .00000545 00000-0 26407-3 0 498
2 21263 98.6246 181.1146 0011965 277.1427 82.8403 14.22412108158379
MET-3/5
1 21655U 91056A 94148.45432105 .00000051 00000-0 10000-3 0 7123
2 21655 82.5512 130.6819 0011557 248.1688 111.8208 13.16830563133866
MET-2/21
1 22782U 93055A 94148.68922043 .00000063 00000-0 43931-4 0 3057
2 22782 82.5491 221.8821 0021015 282.9730 76.9084 13.83007584 37391
POSAT
1 22829U 93061G 94148.75442192 .00000035 00000-0 31967-4 0 2870
2 22829 98.6491 224.8119 0009251 255.4590 104.5565 14.28026396 34921
MIR
1 16609U 86017A 94151.24592674 .00004896 00000-0 75236-4 0 6297
2 16609 51.6483 271.0844 0001970 346.1860 13.9079 15.56249388473400
HUBBLE
1 20580U 90037B 94152.21663965 .00000512 00000-0 35846-4 0 4929
2 20580 28.4695 338.5655 0006073 279.9168 80.0726 14.90615418 27005
GRO
1 21225U 91027B 94149.88243731 .00002212 00000-0 46180-4 0 1031
2 21225 28.4617 359.2112 0003353 5.4958 354.5681 15.40862011 54111
UARS
1 21701U 91063B 94151.54499032 -.00003847 00000-0 -31456-3 0 5358
2 21701 56.9959 225.7702 0005799 111.4559 248.7094 14.96547438148443
/EX
```

810. What SAT's can I hear on a Scanner ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 15:35:02 UTC
From: gumbyrama@aol.com
Message-ID: <2snij6$7un@search01.news.aol.com>
Source record: 27459

I just rec'd my no-code Tech license and am very interested in the AMSAT's.
I use STS Plus tracking software and have been tracking the AO-21 bird and can hear it fairly well with a PRO 2006 and a RS Discone. I am becoming familiar with the procedures to operate with and am blown away by all this cool stuff.

I also have a shortwave with usb/lsb.

My main question is what other SAT's can i hear with my equipment now? I really would like to know what is out there before I choose my equipment

Thanks in Advance. Brad

811. Re: Orbital Elements for the Moon?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 18:50:48 UTC
From: johnsotc@sd2.af.mil
Message-ID: <1994Jun3.185048.10425@afit.af.mil>
Source record: 27611

In article <2sik3c$6ko@crchh7b0.bnr.ca>, debaker@bnr.ca (David Baker) writes:
|>
|> Greetings,
|>
|> I was just wondering if there are orbital elements for the moon
|> that could be entered into a satellite tracking program. Two line
|> NASA format would be best. While we're at it, how about elements
|> for the sun?
|>
|> Thanks,
|> +---+
>	David E. Baker Internet: debaker@bnr.ca (Richardson, TX, USA)
>	Callsign: AB5PI Amateur Packet: AB5PI@N5AUX.#DFW.TX.USA.NA
>	My opinions do not necessarily reflect the opinions of my employer
> +---+

The following is from a previous article written on the subject:

Sender: news@freenet.carleton.ca
Reply-To: ae517@FreeNet.Carleton.CA (Russ Renaud)
Organization: The National Capital FreeNet, Ottawa, Ontario, Canada
References: <2d2e8a6b@sm0nbj.ct.se>
Date: Tue, 11 Jan 1994 13:56:37 GMT
Lines: 29

MOON
1 0002 93360.0000000 0.0000000 00000-0 00011
2 0002 22.4297 346.9573 .040813 180.3337 265.5319 0.035749304251

I can not vouch for the long-term accuracy of these keps, as I merely
pulled them off the local packet bbs. The two times I have plugged them
into to mactrak, it seem to work, ie the software predicted that the moon was
visible, and lo and behold, that great orb in the sky was actually there!

de Russ
VA3RR/AA8LU
in beautiful downtown Ottawa

*** I survived the Beijing flu!! ***

--

812. NAVSPASUR listeners?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 19:13:41 UTC
From: thomsona@netcom.com
Message-ID: <thomsonaCqu5Et.5q6@netcom.com>
Source record: 27619

Over the past three or four years there has been occasional discussion in the Compuserve satellite watchers' group concerning reception of U.S. Navy space surveillance system (NAVSPASUR) VHF (ca. 219 MHZ) signals as they are reflected by satellites passing through the system's fan beams. The CW beams, radiated from the primary transmitter at Lake Kickapoo TX and two secondary sites in Arizona and Alabama, are narrow in the north-south direction and wide east-west. Satellites crossing a beam cause a "ping" which can be analyzed for angle-of-arrival and doppler to gain information about the satellite's orbital parameters. As the system is used by the Navy, several receiver sites are involved and the total amount of angle-of-arrival data (I don't think they use the doppler) is sufficient to determine the orbit completely. The most advanced of the Compuserve observers uses time-of-crossing, doppler, and coarse angle-of-arrival at a single site to partially determine the orbit, or to generate differential corrections to orbital elements previously determined.

The discussion on CIS has been useful to me since I'm doing a study of relatively cheap ways to do space surveillance, and I'd like to ask the wider world of the Net if anyone else is doing "unofficial" NAVSPASUR listening. If so, what kind of equipment and orbit determination algorithms are being used? Related techniques, such as use of the signals from powerful TV and FM radio stations, ATC radars, etc. would also be of interest.

813. LUSAT-1 (LO-19): Actual status

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 19:44:00 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.2FqkNc1w165w@asarin.org.ar>
Source record: 27636

Official LUSAT-1 Status Report

Overseas stations: If you capture any LUSAT-1 telemetry and send it in raw-mode to the satellite control station, you'll receive a certificate for your collaboration. These telemetry reports can be sent either via packet radio to LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Internet to: lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS is NOT LOADED and it will NOT be operational for the next 2 weeks (approx.).

The LUSAT-1 recovery team want to thanks all the stations that sent LUSAT-1 telemetry data in RAW format.

The overseas stations that are going to receive the Special Award are:

JN2LHU, OZ6BL, OZ7SAT, EA1BCU, EA2CLS, WH6I, W9ODI, SM5BVF, ZS6BMN, JJ1WTK, LU1FYZ, LU2FCY, LU2JCI, LU1JBR, LU8ENU, LU6DYD and LU1DBC.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)

packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

814. Need NORAD elements !!!

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 21:32:41 UTC
From: lu7akc@asarin.ORG.AR
Message-ID: <gate.75LBNc1w165w@asarin.org.ar>
Source record: 27457

Hi!
I need the latest NORAD Keplerian elements and I don't know where I can get them. If you know where, please forward me that information. Also, if you have an "almost-new" NORAD set, please send it to me.

Thankyou in advance & 73's de Eduardo Sweet Biro (LUSAT-1 recovery team)

E-Mail: lu7akc@asarin.org.ar
Packet: lu7akc@lu7akc.#col.cf.arg.soam

815. Re: What SAT's can I hear on a Scanner ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 21:54:27 UTC
From: greg@core.rose.hp.com
Message-ID: <CquCur.n4D@icon.rose.hp.com>
Source record: 27620

Well, let's see...

AO-27 downlink is on 436.800, FM
RS-10 is on 29.360-400 USB
RS-12 is on 29.410-450 USB

The RS-10 & 12 beacons are 3khz down from the lower edge.

I doubt you'd be able to hear AO-13 or FO-20 (VHF/UHF + SSB + they're weak)

Enjoy!

Greg KD6KGW

816. Two-Line Orbital Element Sets (TLE406)

Newsgroup: rec.radio.amateur.space
Date: 1994-06-03 23:51:12 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.770687472@afit.af.mil>
Source record: 27618

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #406 -
Alouette 1
1 00424U 62049 94150.86459181 .00000027 00000-0 20815-4 0 9991
2 00424 80.4625 302.0920 0023251 157.2831 202.9348 13.67810744580038
ATS 1
1 02608U 66110A 94151.59586369 -.00000284 00000-0 10000-3 0 8753
2 02608 14.5479 0.6069 0010609 41.6241 343.4178 1.00383730 17309
ATS 3
1 03029U 67111A 94150.59829342 -.00000127 00000-0 10000-3 0 1998
2 03029 14.6367 7.6526 0009323 266.8923 83.4225 1.00273017 97250
Cosmos 398
1 04966U 71016A 94154.09324680 .00088210 66393-5 18057-3 0 2544
2 04966 51.4534 25.2721 1039397 322.3252 30.8921 13.85055779770792
Starlette
1 07646U 75010A 94151.59385237 -.00000142 00000-0 -74465-6 0 7863
2 07646 49.8265 218.8357 0206045 281.2881 76.4925 13.82186242975551
LAGEOS
1 08820U 76039A 94147.43538973 .00000006 00000-0 10000-3 0 9990
2 08820 109.8215 128.4943 0044232 289.5911 69.9800 6.38664262165824
ETS-2
1 09852U 77014A 94130.00000000 .00000112 00000-0 10000-3 0 9628
2 09852 12.0881 41.9435 0001849 28.7738 185.2316 1.00010025 9946
GOES 2
1 10061U 77048A 94153.65286249 .00000071 00000-0 00000+0 0 3405
2 10061 11.1713 45.8966 0002076 348.4683 315.6242 1.00261533 6968
IUE
1 10637U 78012A 94150.72744060 -.00000242 00000-0 10000-3 0 77
2 10637 34.5848 95.1647 1314156 35.3385 330.5778 1.00272771 12543
GPS BI-01
1 10684U 78020A 94150.56500752 -.00000069 00000-0 10000-3 0 2729
2 10684 64.6352 46.0352 0062776 163.7839 196.4354 1.98069565104581
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GPS BI-02
1 10893U 78047A 94152.38259569 -.00000061 00000-0 10000-3 0 718
2 10893 63.5583 284.9393 0213786 13.8926 346.6703 2.01627421117752
GOES 3
1 10953U 78062A 94153.43233654 .00000071 00000-0 10000-3 0 3102
2 10953 10.1115 48.6385 0003847 88.6860 95.3211 1.00281545 11572
SeaSat 1
1 10967U 78064A 94151.56252647 -.00000026 00000-0 36026-4 0 2943
2 10967 107.9967 67.8178 0002403 269.0477 91.0389 14.37957656833978
GPS BI-03
1 11054U 78093A 94149.64308158 -.00000046 00000-0 10000-3 0 1874
2 11054 63.2463 282.2981 0043937 175.9223 184.0991 1.93505222114157
Nimbus 7
1 11080U 78098A 94151.60861030 -.00000066 00000-0 -21777-4 0 3992
2 11080 99.0550 35.8586 0008959 172.5907 187.5385 13.83733319787782
GPS BI-04
1 11141U 78112A 94149.69813477 -.00000062 00000-0 00000+0 0 8862
2 11141 64.6338 47.2620 0048636 25.2419 335.0331 1.92894878 3424
GPS BI-05
1 11690U 80011A 94149.96191896 -.00000061 00000-0 10000-3 0 7904
2 11690 64.9636 47.8409 0141741 195.4853 164.1072 2.00555756119173
GPS BI-06
1 11783U 80032A 94152.26801038 -.00000063 00000-0 10000-3 0 9772
2 11783 62.6638 278.7694 0210082 29.1489 332.0035 2.03456026103639
GOES 5
1 12472U 81049A 94149.94702009 .00000056 00000-0 10000-3 0 7719
2 12472 6.7860 58.2175 0006553 10.9465 25.3580 1.00313779 5589
Cosmos 1383
1 13301U 82066A 94150.55119901 .00000024 00000-0 10000-4 0 2972
2 13301 82.9289 322.6848 0028629 140.9356 219.3911 13.68055469595019
LandSat 4
1 13367U 82072A 94151.23814005 .00000080 00000-0 27721-4 0 4943
2 13367 98.1802 210.0822 0006612 315.3643 44.7020 14.57126015631598
IRAS
1 13777U 83004A 94154.04252286 .00000272 00000-0 21768-3 0 6087
2 13777 98.9721 345.2908 0013531 359.3390 0.7742 13.99210881249163
Cosmos 1447
1 13916U 83021A 94151.15866873 .00000074 00000-0 61220-4 0 3987
2 13916 82.9448 24.2956 0039625 76.2295 284.3266 13.74310581560994
TDRS 1
1 13969U 83026B 94151.77246751 -.00000198 00000-0 10000-4 0 3062
2 13969 7.6724 51.2705 0006323 64.1169 136.6153 1.00264893 13885
GOES 6
1 14050U 83041A 94152.29319368 -.00000055 00000-0 10000-3 0 2110
2 14050 5.5870 61.2840 0005495 341.7778 200.9341 1.00218143 12628
OSCAR 10
1 14129U 83058B 94150.69677441 -.00000061 00000-0 10000-3 0 2876
2 14129 27.1154 325.0714 6022081 182.4311 172.2849 2.05880205 54451
LandSat 5
1 14780U 84021A 94151.55061960 .00000067 00000-0 24793-4 0 822
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2 14780 98.1625 211.6440 0004443 326.8599 33.2323 14.57133082545057
UoSat 2
1 14781U 84021B 94151.06697961 .00000105 00000-0 25653-4 0 6976
2 14781 97.7873 166.5950 0011480 330.9202 29.1364 14.69214238547796
GPS BI-09
1 15039U 84059A 94152.77836702 -.00000084 00000-0 10000-4 0 2075
2 15039 63.9164 41.5113 0055555 215.8247 143.8673 2.00558335 73034
Cosmos 1574
1 15055U 84062A 94151.24512202 .00000019 00000-0 43447-5 0 5975
2 15055 82.9553 77.5459 0025981 264.9021 94.9171 13.73605880498302
GPS BI-10
1 15271U 84097A 94152.19226064 -.00000064 00000-0 10000-3 0 8089
2 15271 62.3632 278.8181 0145388 349.1618 10.5193 2.00580669 70288
Cosmos 1602
1 15331U 84105A 94152.19661190 .00000294 00000-0 32112-4 0 2895
2 15331 82.5333 92.6999 0018326 257.5113 102.4050 14.84407937522140
NOAA 9
1 15427U 84123A 94153.87397542 .00000092 00000-0 73056-4 0 8258
2 15427 99.0546 204.1971 0014068 260.9539 99.0036 14.13619175488321
GPS BI-11
1 16129U 85093A 94133.02681012 -.00000038 00000-0 00000+0 0 5902
2 16129 63.7139 44.1112 0202757 241.5401 72.5072 1.92717110 62913
Mir
1 16609U 86017A 94153.94291680 .00003879 00000-0 60993-4 0 6305
2 16609 51.6480 257.5963 0002277 2.6611 357.4385 15.56271576473823
SPOT 1
1 16613U 86019A 94152.85086504 .00000089 00000-0 62356-4 0 6842
2 16613 98.6857 226.7631 0000761 93.5415 266.5851 14.20051683114380
Cosmos 1766
1 16881U 86055A 94152.03793001 .00000244 00000-0 26818-4 0 2051
2 16881 82.5193 150.8608 0017527 283.9009 76.0255 14.83436112423068
EGP
1 16908U 86061A 94152.25602055 -.00000097 00000-0 00000+0 0 8941
2 16908 50.0062 133.3766 0011381 270.4250 89.5276 12.44410200 23406
NOAA 10
1 16969U 86073A 94153.97282585 .00000051 00000-0 40044-4 0 7252
2 16969 98.5103 163.4113 0013869 16.0751 344.0865 14.24887526400589
MOS-1
1 17527U 87018A 94154.21226294 .00000091 00000-0 99794-4 0 800
2 17527 99.0324 223.1942 0001267 20.1505 339.9706 13.94907213370997
GOES 7
1 17561U 87022A 94153.49697707 -.00000050 00000-0 10000-3 0 8595
2 17561 1.5123 76.1325 0005441 346.2198 255.3994 1.00266336 9828
Kvant-1
1 17845U 87030A 94152.72284967 .00002457 00000-0 41170-4 0 8678
2 17845 51.6464 263.7020 0001701 5.9299 354.1367 15.56257597473708
DMSP B5D2-3
1 18123U 87053A 94153.87249562 .00000014 00000-0 29446-4 0 5072
2 18123 98.7880 345.7906 0013172 219.9282 140.0926 14.15358694358989
RS-10/11
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1 18129U 87054A 94151.51951043 .00000057 00000-0 45799-4 0 9061
2 18129 82.9242 341.1657 0013332 71.1063 289.1529 13.72337845347628
Meteor 2-16
1 18312U 87068A 94152.18127046 .00000060 00000-0 40616-4 0 2950
2 18312 82.5564 224.5481 0012680 150.0894 210.0985 13.84031456342848
Meteor 2-17
1 18820U 88005A 94153.85947196 .00000029 00000-0 12579-4 0 3017
2 18820 82.5394 279.9778 0015255 218.9398 141.0665 13.84715761320370
DMSP B5D2-4
1 18822U 88006A 94153.78842128 .00000026 00000-0 30110-4 0 6102
2 18822 98.4432 9.3532 0007575 32.1632 328.0007 14.22952616328478
Glonass 34
1 19163U 88043A 94152.93433946 .00000039 00000-0 10000-3 0 8956
2 19163 65.0326 110.9601 0007441 167.2165 192.7801 2.13102338 46333
Glonass 36
1 19165U 88043C 94152.05168385 .00000044 00000-0 10000-3 0 2908
2 19165 65.0039 110.9480 0000776 49.4303 310.5310 2.13102081 46936
METEOSAT 3
1 19215U 88051A 94152.57724631 -.00000262 00000-0 10000-3 0 9148
2 19215 1.7038 72.5276 0000902 9.9709 301.0604 1.00273360 9750
AO-13
1 19216U 88051B 94147.27035052 -.00000441 00000-0 10000-4 0 9209
2 19216 57.8366 250.5249 7207923 342.4663 2.0218 2.09724553 14073
OKEAN 1
1 19274U 88056A 94152.27205573 .00000300 00000-0 34497-4 0 9053
2 19274 82.5139 250.5449 0021879 63.5620 296.7821 14.82177238318720
Meteor 3-2
1 19336U 88064A 94151.52504778 .00000051 00000-0 10000-3 0 2922
2 19336 82.5409 335.4775 0016378 308.6445 51.3205 13.16967657281065
Glonass 39
1 19503U 88085C 94152.54686430 -.00000055 00000-0 10000-3 0 1889
2 19503 65.7340 349.8543 0006667 168.3805 191.6819 2.13102281 44437
NOAA 11
1 19531U 88089A 94153.97953316 .00000119 00000-0 88748-4 0 6477
2 19531 99.1705 142.5418 0011599 168.9012 191.2417 14.12990783293215
TDRS 2
1 19548U 88091B 94153.29095685 -.00000138 00000-0 10000-3 0 9323
2 19548 0.9790 77.7302 0002302 111.4006 78.4745 0.99823244 8059
Glonass 40
1 19749U 89001A 94150.23985057 .00000043 00000-0 10000-3 0 3968
2 19749 64.9737 110.6190 0007146 259.3281 100.5660 2.13101416 41893
Glonass 41
1 19750U 89001B 94151.23488000 .00000045 00000-0 10000-3 0 2924
2 19750 64.9923 110.6472 0005771 231.0920 128.8282 2.13101802 41931
GPS BII-01
1 19802U 89013A 94149.27789443 .00000043 00000-0 10000-3 0 9094
2 19802 55.1014 140.4658 0031398 180.0455 179.9521 2.00549526 38674
Akebono
1 19822U 89016A 94153.14564797 .00006781 00000-0 36563-3 0 2712
2 19822 75.1188 191.0333 3820181 301.9217 26.5109 7.78129588108120
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Meteor 2-18
1 19851U 89018A 94152.03234819 .00000045 00000-0 26819-4 0 2937
2 19851 82.5169 156.8006 0012615 274.1559 85.8154 13.84365558265452
MOP-1
1 19876U 89020B 94146.00000000 -.00000083 00000-0 00000+0 0 334
2 19876 0.4041 359.9990 0001507 94.2809 140.8811 1.00266842 03
TDRS 3
1 19883U 89021B 94153.40880250 -.00000270 00000-0 00000+0 0 9313
2 19883 0.0931 89.8021 0001018 337.1794 289.7793 1.00266730 89317
GPS BII-02
1 20061U 89044A 94149.12473301 -.00000081 00000-0 10000-3 0 9299
2 20061 54.6698 317.2273 0128422 208.1703 151.1155 2.00565463 36418
Nadezhda 1
1 20103U 89050A 94153.87967768 .00000007 00000-0 -81730-5 0 25
2 20103 82.9578 298.3053 0037360 331.8732 28.0407 13.73838871246342
GPS BII-03
1 20185U 89064A 94151.95247064 .00000067 00000-0 00000+0 0 9217
2 20185 54.9335 140.9718 0010364 269.3816 90.4956 2.00573456 35043
GMS 4
1 20217U 89070A 94149.42685750 -.00000299 00000-0 10000-3 0 187
2 20217 0.2210 67.8706 0001003 53.7352 58.6471 1.00262823 17904
GPS BII-04
1 20302U 89085A 94148.49655998 -.00000043 00000-0 00000+0 0 9287
2 20302 53.5822 257.5569 0002421 242.4277 117.5684 2.00564820 33779
Meteor 3-3
1 20305U 89086A 94154.19493173 .00000044 00000-0 10000-3 0 635
2 20305 82.5535 279.6467 0006358 334.3204 25.7606 13.04414505221077
COBE
1 20322U 89089A 94152.02075342 .00000061 00000-0 67292-4 0 142
2 20322 98.9792 168.3779 0008484 319.8469 40.2061 14.03440576232127
Kvant-2
1 20335U 89093A 94152.72284967 .00002457 00000-0 41170-4 0 9375
2 20335 51.6464 263.7020 0001701 5.9299 354.1367 15.56257597473627
GPS BII-05
1 20361U 89097A 94149.50245579 -.00000019 00000-0 10000-3 0 8038
2 20361 55.5222 83.0286 0071296 108.5562 252.2053 2.00559969 23272
SPOT 2
1 20436U 90005A 94153.73679427 .00000095 00000-0 65161-4 0 7980
2 20436 98.7183 228.3899 0000818 3.6253 356.4929 14.20033726226040
UO-14
1 20437U 90005B 94153.17990782 .00000021 00000-0 25212-4 0 9994
2 20437 98.5854 238.1595 0010442 232.0072 128.0168 14.29845045227444
UO-15
1 20438U 90005C 94153.17913973 .00000011 00000-0 21450-4 0 7999
2 20438 98.5891 237.1496 0009212 238.8223 121.2058 14.29176890227369
PACSAT
1 20439U 90005D 94152.67626340 -.00000043 00000-0 17750-6 0 7988
2 20439 98.5904 238.8793 0010635 234.1562 125.8651 14.29898600227380
DO-17
1 20440U 90005E 94152.70208049 .00000198 00000-0 93443-4 0 7987
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2 20440 98.5963 239.2226 0010722 234.4212 125.5975 14.30038789227400
WO-18
1 20441U 90005F 94152.74710037 .00000046 00000-0 34902-4 0 8008
2 20441 98.5946 239.2691 0011291 234.6529 125.3578 14.30012820227419
LO-19
1 20442U 90005G 94152.72631273 .00000034 00000-0 30006-4 0 7974
2 20442 98.5974 239.4994 0011482 235.4296 124.5795 14.30108410227425
GPS BII-06
1 20452U 90008A 94153.39211105 .00000034 00000-0 10000-3 0 9120
2 20452 54.0459 197.1229 0053180 75.2177 285.4460 2.00549223 31852
MOS-1B
1 20478U 90013A 94153.68359618 .00000091 00000-0 10000-3 0 6353
2 20478 99.0366 226.8158 0001018 68.5112 291.6158 13.94905460140627
DEBUT
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1994030F
1 23117U 94030F 94153.44154101 -.00000013 00000-0 14928-3 0 52
2 23117 47.4060 273.1974 7212313 3.5369 359.5345 2.33002165 348
1993073E
1 23118U 93 73 E 94150.37883330 -.00000275 00000-0 00000+0 0 19
2 23118 0.9865 270.2950 0065470 338.4488 280.8293 0.99998024 439
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

817. Re: Oscar antennas?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-04 15:12:20 UTC
From: mbutts@netcom.com
Message-ID: <mbuttsCqvowK.DDH@netcom.com>
Source record: 27617

blaknite@pipeline.com (Noah Lehmann-Haupt) writes:

>I was thinking about getting Cushcrafts AOP bundle oscar
>antennas. It seems like a good deal at $250. Can anyone give
>me some ideas about this? Thanks...

NO! They are garbage. I got that setup at first and was horrified at the poor quality of construction. Crimp-on PL-259s for one example. No way to get the elements straight for another. Two different spacings of the sections, comparing the manual with the crude markings on the boom pieces, which are held together with hose clamps. Cheezy gamma match. I didn't want to think about what those antennas would look like after a year of Oregon rain.

AES was kind enough to take them back and send me some KLMs instead (+ $$ of course :-). 14C/18C. Beautiful. Very well made. Teflon coax in the phasing lines. Good baluns matching folded dipoles. Excellent manual. I worked 66 countries on AO-13 in a year of casual operation with that setup.

OSCAR 13 is weak signal work. If I didn't have total confidence in my antennas I'd always wonder, is that signal I can't copy really that weak, or is it me...

73 de KC7IT

--
Mike Butts, Portland, Oregon mbutts@netcom.com

818. ARLK022 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-06-04 20:01:24 UTC
From: w1aw@arrl.org
Message-ID: <$arlk022.1994@ampr.org>
Source record: 27622
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK022
ARLK022 Keplerian data

ZCZC SK89
QST de W1AW
Keplerian Bulletin 22 ARLK022
From ARRL Headquarters
Newington, CT June 4, 1994
To all radio amateurs

SB KEP ARL ARLK022
ARLK022 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94999A 94189.76632148 0.00073311 21920-3 0 22
2 99965 28.4664 14.3253 0003598 331.2635 28.7780 15.90320458 27
AO-10
1 14129U 83058B 94150.69677441 -.00000061 10000-3 0 2875
2 14129 27.1154 325.0714 6022081 182.4311 172.2849 2.05880205 54451
RS-10/11
1 18129U 87054A 94151.51951043 0.00000057 00000-0 45799-4 0 9061
2 18129 82.9242 341.1657 0013332 71.1063 289.1529 13.72337845347628
UO-11
1 14781U 84021B 94151.06697961 0.00000105 25653-4 0 6975
2 14781 97.7873 166.5950 0011480 330.9202 29.1364 14.69214238547796
RS-12/13
1 21089U 91007A 94148.13976132 0.00000042 27995-4 0 6960
2 21089 82.9227 26.3188 0029245 161.2877 198.9366 13.74041143165893
AO-13
1 19216U 88051B 94147.27035052 -.00000441 10000-4 0 9208
2 19216 57.8366 250.5249 7207923 342.4663 2.0218 2.09724553 14073
UO-14
1 20437U 90005B 94153.17990782 0.00000021 00000-0 25212-4 0 9994
2 20437 98.5854 238.1595 0010442 232.0072 128.0168 14.29845045227444
AO-16
1 20439U 90005D 94148.26783817 0.00000023 26004-4 0 7976
2 20439 98.5973 234.5240 0010441 251.8891 108.1154 14.29897857226757
```

```
DO-17
1 20440U 90005E 94148.22411695 0.00000019 24245-4 0 7976
2 20440 98.5984 234.7976 0010539 250.6532 109.3505 14.30037363226760
WO-18
1 20441U 90005F 94148.26905745 0.00000015 22857-4 0 7990
2 20441 98.5983 234.8454 0011068 251.1899 108.8082 14.30011720226776
LO-19
1 20442U 90005G 94148.24856903 0.00000023 25921-4 0 7961
2 20442 98.5963 235.0753 0011443 249.3737 110.6220 14.30107631226780
FO-20
1 20480U 90013C 94152.93272559 -.00000013 00000-0 43898-4 0 6943
2 20480 99.0341 307.6380 0541313 14.0465 347.5038 12.83225828202179
AO-21
1 21087U 91006A 94154.05724063 0.00000094 00000-0 82657-4 0 4769
2 21087 82.9410 153.1675 0036482 121.2865 239.1871 13.74540692167646
UO-22
1 21575U 91050B 94148.22067990 0.00000036 26734-4 0 5008
2 21575 98.4361 223.1211 0008131 357.3213 2.7927 14.36916027150217
KO-23
1 22077U 92052B 94153.85584019 -.00000037 00000-0 10000-3 0 3964
2 22077 66.0827 309.9878 0013913 290.9061 69.0468 12.86286385 84944
KO-25
1 22830U 93061H 94153.23377214 -.00000030 00000-0 51586-5 0 3005
2 22830 98.5495 226.6358 0011219 216.5222 143.5193 14.28055112 35567
IO-26
1 22826U 93061D 94148.66455740 0.00000025 28036-4 0 2949
2 22826 98.6516 224.6994 0008492 272.6887 87.3324 14.27728000 34900
AO-27
1 22825U 93061C 94153.23774175 0.00000020 00000-0 26152-4 0 2957
2 22825 98.6524 229.1931 0007876 256.7380 103.2918 14.27624838 35558
PO-28
1 22829U 93061G 94153.23868211 0.00000039 00000-0 33319-4 0 2881
2 22829 98.6497 229.2539 0009228 241.4891 118.5361 14.28027164 35569
Mir
1 16609U 86017A 94153.94291680 0.00003879 00000-0 60993-4 0 6305
2 16609 51.6480 257.5963 0002277 2.6611 357.4385 15.56271576473823

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
June 7, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

819. Quick Question

Newsgroup: rec.radio.amateur.space
Date: 1994-06-05 03:14:27 UTC
From: blaknite@pipeline.com
Message-ID: <2srfuj$n70@pipeline.com>
Source record: 27621

I should probably not ask this here, for fear of getting
hundreds of replies, but I misplaced my sat reference material
and I was wondering if someone could tell me the uplink freq
range on 15 meters for RS-12/13? If you guess that someone
else replied sooner, don't reply. I hope I don't get flooded
for this..hehe..:) 73 all..

Noah AA2KT
blaknite@pipeline.com

820. try this

Newsgroup: rec.radio.amateur.space
Date: 1994-06-05 05:17:00 UTC
From: drew.shobbrook@mcc.sydpcug.org.au
Message-ID: <64.271.500.0N3124D7@mcc.sydpcug.org.au>
Source record: 27634

```
call me if this works
```

821. ANS-155 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-05 23:03:23 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-155.01.1994@ampr.org>
Source record: 27623
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-155.01
DOVE SAYS "HI"

HR AMSAT NEWS SERVICE BULLETIN 155.01 FROM AMSAT HQ
SILVER SPRING, MD JUNE 4, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-155.01

DOVE-OSCAR-17 (DOVE) Voice Synthesizer Now Being Tested

The satellite is now speaking the phrase "HI, this is DOVE in space" for one minute of every four minutes. "HI" has been traditionally sent from Amateur satellites since OSCAR-1, so it seemed appropriate for this re-activation of the voice synthesizer in DO-17. The team will continue to work on improvements, including possibly raising the amplitude of the voice, which is presently about 1/2 that of the telemetry.

The speech software has been completely reloaded over the past 3 days. The S-band transmitter is presently turned off. Transmitter power will be optimized over the next few days while maintaining a positive power budget. Reception reports are welcome and please send them to PY2BJO. Telemetry is not needed at this time.

[The AMSAT News Service would like to thank Jim White (WD0E) for this bulletin item. Jim also wishes to acknowledge the other members of the DOVE Ground Command Team of WJ9F, VK7ZBX, N5AHD, NK6K with additional support from WB6LLO and K0RZ.]

/EX
SB SAT @ AMSAT $ANS-155.02
OFFICIAL LO-19 STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 155.02 FROM AMSAT HQ
SILVER SPRING, MD JUNE 4, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-155.02

Official LUSAT-OSCAR-19 Status Report

On 01-JUN-1994, during orbit #22739, the CW beacon was turned back on. This operation was performed by the control station of Norberto Pennini (LU8DYF) and by the station in charge of the CW beacon, Ruben Ferreiro (LU6DYD).

At the same time, LU8DYF, turned OFF the "B" transmitter (437.125 MHz) and turned ON the "A" transmitter (437.150 MHz). While this procedure was

happening place, LU6DYD was capturing some telemetry. Then, when LU8DYF finally swapped the transmitters, and LU8DYD sent the necessary "pseudo-random" (PN) command sequence which subsequently turned on the CW beacon. After more than 9 months of being turned off, the CW beacon was started up again without any problems.

On 02-JUN-94, during orbit #22754, the CW beacon was turned OFF. This operation was again performed by LU8DYF and LU6DYD. LU6DYD turned OFF the CW beacon and LU8DYF agained swapped the two transmitters to be sure they were both working properly. At the present time, the CW beacon is presently OFF and the "B" Raised Cosine PSK transmitter (437.125 MHz) is now ON.

The LUSAT-1 Recovery Team encourages those stations that have collected telemetry reports during this period to send them to LU8DYF for analyses purposes.

Overseas stations: If you capture any LUSAT-1 telemetry and send the "raw" satellite telemetry to the satellite control station, you will receive a certificate for your help. These telemetry reports can be sent either via packet radio to LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Internet to: lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS is NOT LOADED and it will NOT be operational for the next 2 weeks (approx.).

The LUSAT-1 recovery team want to thanks all the stations that sent LUSAT-1 telemetry data in RAW format.

The overseas stations that are will receive the Special Award are:

1) Mr. Norimasa Okamoto (JN2LHU) from Gamagori, Japan.
2) Mr. Bent Bagger (OZ6BL+OZ7SAT) from Denmark.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)

packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

[The AMSAT News Service (ANS) would like to thank Eduard Sweet (LU7AKC) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-155.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 155.03 FROM AMSAT HQ
SILVER SPRING, MD JUNE 4, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-155.03

Weekly OSCAR Status Reports: 04-JUN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |

Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The analog mode will be continued indefinitely.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]

LO-19: LO-19 is on the air but only telemetry is being sent and there are
are no BBS functions operational. Expect a few more weeks before
the BBS returns. [WH6I]

KO-23: This bird and KO-25 are very busy at the present time with message
and file traffic. Also, the program WISP can also be found on the
BBS. WH6I also notes that there are alot of earth image files
on the BBS. [WH6I]

AO-16: AO-16 is running strong, the only 1200 baud bird in operation at the
present time. WH6I is uploading the WISP program to AO-16 for
users to test out. [WH6I]

IO-26: IO-26 has not been heard from for awhile. [WH6I]

MIR: For all who have made a contact with MIR and would like to receive a
QSL card, send your QSLs to the following address:
RV3DR-Serge Samburov, Space "MIR" QSL Manager
Chief of Cosmonaut Amateur Radio Department NPO "Energia"
P.O. BOX 73, Kaliningrad-10 city, Moscow Area, 141070, RUSSIA.
RV3DR's packet radio address is as follows: RV3DR@R0MIR-1 or
RV3DR@RK3KP.#MSK.RUS.EU

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current
set of orbital elements are not generating the correct AOS/LOS times at
your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you
provide will be of value to all OSCAR enthusiasts.

/EX

822. ANS-148 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-05 23:03:43 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-148.01.1994@ampr.org>
Source record: 27624
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-148.01
CALL FOR PAPERS

HR AMSAT NEWS SERVICE BULLETIN 148.01 FROM AMSAT HQ
SILVER SPRING, MD MAY 28, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-148.01

Call For Papers For The AMSAT-NA Space Symposium & Annual Meeting

The 1994 AMSAT-NA Annual Meeting and Space Symposium is to be held Oct. 7-9, in Orlando, FL. This is a call for papers and presentors. Come help us celebrate 25 years of AMSAT in Space. Share your experience with the amateur satellite community. We need your help to be a success. Editing, formatting, graphics and even typing can be provided. Even if you cannot attend, please consider a paper for publication.

Topics for all amateur satellite disciplines are sought. The following is the schedule for receiving papers for the Symposium:

Author and Title requested ASAP.
Compose a short abstract by July 1.
Final drafts are requested on or about August 26.

Direct your inputs and inquiries to:

Steve Park (WB9OEP)
12122 99th Ave. N.
Seminole, FL 34642
Phone: (813) 391-7515
Internet: SKPA@QMGATE.ECI-ESYST.COM
Pkt Radio: WB9OEP @ W4DPH

Join us in Orlando, FL for the fun and festivities. For more information about the Symposium, contact AMSAT-NA Headquarters at (301) 589-6062.

/EX
SB SAT @ AMSAT $ANS-148.02
K9PVW BECOMES A SILENT KEY

HR AMSAT NEWS SERVICE BULLETIN 148.02 FROM AMSAT HQ
SILVER SPRING, MD MAY 28, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-148.02

KARL O. "K. O." LEARNER II, K9PVW, SK

An old friend to many in the amateur satellite world and long-time AMSAT member, "K.O." LEARNER II (K9PVW) became a Silent Key (SK) recently. "K.O" died on 16-May-94 at his home in Kokomo, Indiana. He was 49. For many years, "K.O." organized the AMSAT booth and programs at Dayton, worked tirelessly as an AMSAT area coordinator, and ran a local AMSAT Net. Also, many will remember him as the Net Control Station for what is today known as the "OPS Nets" in the early days of AO-13. "K.O." worked as an engineer for Delco Electronics in Kokomo. AMSAT-NA Headquarters wishes to express its condolences to "K.O's" family and friends and will remember him as a patient "ELMER" to many beginners trying to make their first contacts on the OSCARS.

[The AMSAT News Service (ANS) would like to thank Martha Saragovitz of AMSAT-NA Heaquarters for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-148.03
DOVE STATUS

HR AMSAT NEWS SERVICE BULLETIN 148.03 FROM AMSAT HQ
SILVER SPRING, MD MAY 28, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-148.03

DOVE-OSCAR-17 (DO-17) Status Report

On 25-MAY-94 at 05:25 UTC the DOVE Ground Command Team started loading and executing test software designed to assure the operation of the voice module after several months of dormancy. A brief test of the voice capability generated only garbled voice, so it was turned off. The Team is now investigating possible causes, and at this point believe it is a software problem, not hardware.

For the next few days DOVE may be in various modes as the Team continues testing and/or loading new software. The S-band transmitter will remain off. Telemetry reports are not needed at this time.

[The AMSAT News Service (ANS) would like to thank Jim White (WD0E) for submitting this bulletin item. WD0E can be reached at his INTERNET address of wd0e@amsat.org.]

/EX
SB SAT @ AMSAT $ANS-148.04
OFFICIAL LO-19 STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 148.04 FROM AMSAT HQ
SILVER SPRING, MD MAY 28, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-148.04

Official LUSAT-OSCAR-19 (LO-19) Status Report

The satellite LUSAT-1 (LO-19) appears to be healthy. The software load was intentionally stopped when the second module was just loaded and turned on. The next step will be to continue with the satellite's deep tests. The

satellite is sending telemetry on 437.125 MHz and its digipeater is turned on for now. To All Overseas Stations: If you have captured any LUSAT-1 telemetry you are requested to send the "raw" telemetry to the satellite control station and you will receive a certificate for your efforts. These tele-metry reports can be sent either via packet radio to: LU8DYF@LU8DYF.BA.ARG.SOAM and LU8DYF@ANY-ACTIVE-SATELLITE, or via Internet to: lu8dyf@asarin.org.ar

If you intend to use the satellite, please remember that the BBS software is NOT LOADED and it will NOT be operational for the next 3 weeks, approx-imately.

We wish to thanks LU8DYF and all the other stations that helped in the LUSAT-1 recovery: LU1DBC, LU1EXC, LU1FYZ, LU2BDT, LU2FHE, LU3AGY, LU4AGC, LU4FIO, LU6DYD, LU7ABF, LU7AKC, LU7DSU, LU7XAC, LU8ENU and LW1EEO.

73's de Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)
packet: lu7akc@lu7akc.#col.cf.arg.soam
e-mail: lu7akc@asarin.org.ar

/EX
SB SAT @ AMSAT $ANS-148.05
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 148.05 FROM AMSAT HQ
SILVER SPRING, MD MAY 28, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-148.05

Weekly OSCAR Status Reports: 28-MAY-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

FO-20: The analog mode will be continued indefinitely.
[Kazu Sakamoto (JJ1WTK) qga02014@niftyserve.or.jp]
`

KO-25: Please note that the KO-25 uplink was switched back to 145.980 MHz. The downlink is 436.500 MHz. [K6OYY]

AO-16: AO-16 is chugging along, the only 1200 baud BBS bird running. [WH6I]

LO-19: LO-19 is undergoing re-uploading of software. The ground controllers state that it will not be available for general use for about a month. [WH6I]

IO-26: IO-26 is also in the software uploading process. Apparently both birds, i.e., LO-19 & IO-26, suffered SEUs at about the same time. [WH6I]

MIR: MIR'S BBS is up and running. It seems that whatever electrical power problems they were experiencing aboard MIR have now been sorted out. ZR5JRS has worked the MIR BBS on a number of occassions over the last week with only a few problems. The only problem he has experienced is with users down-range that do not send the disconnect command before MIR goes LOS at their QTH. If a several users forget to send the disconnect, ZR5JRS find that nobody can not get in since the BBS has not yet given a time out. Please don't forget to send a disconnect command before MIR goes "over-the-horizon" at your QTH. [ZR5JRS @ ZS0HFS.NTL.ZAF.AF]

RS-10\11: This satellite, as usual, is working extremely well and ZR5JRS has made many contacts throughout Southern Africa with good 599 signals. ZR5JRS notes that it is very pleasant to see a small but revived interest in RS-10 in South Africa. He hopes that it will last. [ZR5JRS @ ZS0HFS.NTL.ZAF.AF]

KO-23: Some new earth images are now showing up on KO-23's BBS. WH6I notes that so far none of the images he has looked are very spectacular. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

823. Re: ANS-148 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-06 11:49:02 UTC
From: tstader@aol.com
Message-ID: <2sv2fe$1qr@search01.news.aol.com>
Source record: 27625

In article <$ans-148.01.1994@ampr.org>, Dave Cowdin
<cowdin@pogo.den.mmc.com> writes:

Thanks Dave for reposting these... for some reason they never showed
up in the amsat-bb list nor made it here to the USENET newsgroups.

Terry Stader-KA8SCP/1
AOL Ham Radio Club Host

824. Re: What SAT's can I hear on a Scanner ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-06 12:48:49 UTC
From: sford@arrl.org
Message-ID: <1994Jun6.124849.23420@arrl.org>
Source record: 27626

Greg Dolkas (greg@core.rose.hp.com) wrote:
: Well, let's see...

: AO-27 downlink is on 436.800, FM
: RS-10 is on 29.360-400 USB
: RS-12 is on 29.410-450 USB

: The RS-10 & 12 beacons are 3khz down from the lower edge.

: I doubt you'd be able to hear AO-13 or FO-20 (VHF/UHF + SSB + they're weak)

: Enjoy!

: Greg KD6KGW

Add: DOVE-OSCAR 17 on 145.825 MHz
AMSAT-OSCAR 21 on 145.985 MHz
MIR Space Station on 145.55 MHz

You should be able to receive OSCAR 17 and OSCAR 21 easily with a
scanner. MIR is also quite strong, but the cosmonauts keep an
erratic schedule. It's sometimes difficult to catch them on the air.

73 . . . Steve, WB8IMY
ARRL

825. * SpaceNews 06-Jun-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-06-06 17:47:44 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0606.1994@ampr.org>
Source record: 27629
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0606
* SpaceNews 06-Jun-94 *

BID: $SPC0606

=========
SpaceNews
=========

MONDAY JUNE 6, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* DOVE SPEAKS *
===============
It has been said that good things come to those who wait, and this week it
is a pleasure to report that DOVE-OSCAR-17 is uttering its first words!
Congratulations to Jim White, WD0E, and the other spacecraft controllers
for their fine effort in bringing this injured satellite back to life.

* MIR INFORMATION *
===================
Sven Grahn of Sollentuna, Sweden provided the following information
regarding the frequencies and emissions used by the Mir space station.

Sven reports the signals on 166 MHz are PCM FM signals and the modulation
index is so high that two peaks appear in the signal spectrum, one on
each side of the carrier. The carrier is on 166.000 MHz creating a signal
peak at 166.150 MHz and another peak at 165.850 MHz.

The signals from Soyuz and Progress on 922.75 MHz contain a carrier plus
telemetry sidebands. The modulation type is unknown. Sometimes tones
are frequency modulated on the carrier. These contain sixteen-bit words,
which probably constitute a command verification link. There is a similar
link from Soyuz and Progress on 926.07 MHz operating simultaneously with
the 922.75 MHz link.

For Progress and Soyuz, the 922, 926 and 166 MHz signals are switched on
simultaneously by ground command.

[Info via Sven Grahn]

* UNAMSAT-1 NEWS *
==================
The launch campaign for the UNAMSAT-1 MicroSat is currently underway with
launch set for 15th June, but there is a possibility that it might be

delayed about one week. The launch will be on a refurbished Soviet SS-18 ICBM designed to carry satellites. The final Keplerian elements of the intended orbit are not known, but the known parameters are as follows:

Orbital Inclination = 73 degrees
Altitude = 730 KM
Orbital Eccentricity = 0.00000000

The satellite will separate from the rocket with no spin. All transmitters will be silent at separation and for a period of at least 1 hour. The VHF receive antenna and the two halves of the canted dipole for 40.997 MHz will be collapsed and then they will be deployed 3 minutes after separation.

The following information was first published in mid-1992, but may have changed since:

As with the earlier MICROSATs, UNAMSAT-1 it has five modules, each about 20 cm on a side. Four of the five modules are updated clones of existing MicroSat hardware/software carrying Dual 70cm PSK transmitters; a computer and power system; a 5-channel 2M FSK receiver and running similar software to the other MICROSATs. The main differences from the earlier MicroSat configuration are that the computer will have 4 MB of RAM instead of 8 MB and UNAMSAT-1 will be equipped with Gallium Arsenide solar panels.

The innovative new addition is a brand new on-board experiment in the 5th "TSFR" ("This Space For Rent") module:

UNAMSAT-1's primary mission is to act as meteor sounder. It will contain a 40.097 MHz transmitter with 60 watts output during pulses from which can be varied from 1 to 10 msec in duration and with a pulse repetition rate of 1 to 10 seconds, as controlled by a computer subsystem. The meteor echoes will be detected on a receiver at the same frequency designed to detect the returned echo and measure its doppler shift. The use of the meteor sounder is to obtain research data on the full-sky spatial and velocity distribution of meteors, with the focus on a search for high-velocity meteors originating outside our solar system.

The 40 MHz frequency for this transmitter is in accordance with the ITU frequency allocations table for scientific research and both the 40 MHz and amateur frequencies have been licensed by Mexican authorities.

The meteor receiver is an SSB "zero-IF" design and the return echoes are digitized and stored in the normal computer's RAM. After each pulse, the spectrum of the received signal will be determined using the onboard computer as a DSP Fourier Transform spectrum analyzer. If a meteor echo is detected, the echo will be saved for later transmission as a special telemetry frame.

The 1-10 second repetition rate for the meteor transmitter will be adjusted depending on the state of charge of the batteries and other spacecraft power requirements, and also on the time domain requirements of the echoes.

When UNAMSAT-1 is not involved in meteor research, it can be turned into a standard PACSAT message store-and-forward satellite and data will be sent using standard amateur AX.25 packet but the actual frequencies haven't been determined yet.

[Info via Richard, G3RWL @ GB7HSN.#32.GBR.EU]

* LUSAT-1 NEWS *
==========
The following packet frame was received from LUSAT-1 on 29-May-94 by KD2BD in New Jersey at 16:11 UTC:

LUSAT-1>AMARG [29-05-94 16:11:21] <UI>:

May 21.

OBC crashed on May 17 at +/- 2:45 utc, lat 45s, lon 43 w.
Only digipeater is available.

LU8DYF, LO-19 command station.

Raw telemetry should be directed to Noberto, LU8DYF either via packet radio at LU8DYF@LU8DYF.BA.ARG.SOAM, via the Internet at lu8dyf@asarin.org.ar, or via any active Pacsat by directing the message to LU8DYF. Special awards are available to those who submit telemetry reports.

* REPORT FROM HI8 *
==========
Bill Meara, N2CQR/HI8 in Santo Domingo in the Dominican Republic sent a FAX to let everyone know that there is a small but enthusiastic group of satellite operators in his country. Pericles, HI8P, a lifetime member of AMSAT, and others have recently been bit by the RS satellite bug. They also listen for DOVE, connect to Mir, and work the SAREX experiments when flown on the US Space Shuttles.

Bill reports that RS-10 and RS-12 are performing well, and that QSLs for ROBOT contacts are available through DF4XW. Bill uses an old Hallicrafters HT-37 transmitter and Drake 2-B receiver with dipole antennas to work RS-12 Mode K. His station is just another example of a low-cost, low-frills station that can be used to make satellite contacts.

* FO-20 NEWS *
==========
On 19-May-94, the FO-20 command station announced that a problem exists in FO-20's onboard computer system. The satellite's transponder will remain in the analog mode (JA) until further notice.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

N2CQR/HI8 N2OFM G3BGM KE4HSB VK4BY N0LBN

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: kd2bd@ka2qhd.de.com
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

826. ARLS023 AMSAT call for papers

Newsgroup: rec.radio.amateur.space
Date: 1994-06-06 21:03:30 UTC
From: w1aw@arrl.org
Message-ID: <$arls023.1994@ampr.org>
Source record: 27628
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS023
ARLS023 AMSAT call for papers

ZCZC AS67
QST de W1AW
Space Bulletin 023 ARLS023
From ARRL Headquarters
Newington, CT June 6, 1994
To all radio amateurs

SB SPACE ARL ARLS023
ARLS023 AMSAT call for papers

AMSAT call for papers

The 1994 AMSAT-NA Annual Meeting and Space Symposium will be held October 7 to 9, in Orlando, Florida. AMSAT seeks papers for the symposium and can provide authors with help in editing and graphics, if needed. Papers are welcome even if the author is unable to attend the symposium.

Topics for all amateur satellite disciplines are sought, including introductory tutorials, satellite operations, Phase IIID design and development, and new applications and techniques.

Sign up now and request an author's kit, then compose a short abstract by July 1. Final drafts are requested on or about August 26.

Direct inquiries to Steve Park, WB9OEP, 12122 99th Ave North, Seminole, FL 34642. Tel (813) 391-7515.
NNNN
/EX

827. q

Newsgroup: rec.radio.amateur.space
Date: 1994-06-07 00:55:28 UTC
From: mmjjmm@post.its.mcw.edu
Message-ID: <2t0gi0$88o@post.its.mcw.edu>
Source record: 27627

--
Michael J. Malloy Amateur Radio N9WJV
Medical College of Wisconsin Compuserve 70334,3563
Milwaukee, Wisconsin Internet mmjjmm@post.its.mcw.edu

828. Quadrifilar helix ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-07 21:11:38 UTC
From: bmm1@freenet.scri.fsu.edu
Message-ID: <199406072101.AB18944@freenet3.scri.fsu.edu>
Source record: 27630

I read Dave Guimont's article on quadrifilar helix antennas in the March/april Amsat journal. I would appreciate any info from anyone who has any additional info on these antennas. Specifically does anyone have an answer to these questions:

Which polarity is best for the 9600 FM sats?
Where can one get the copper hard line Dave refers to?
Can these antennas be purchased and from who?
I have the first addition of the Satellite Experimenters Handbook. Does the second edition have more info on these antennas?
Will the Q.H. receive below 20 degrees elevaation. I am using verticle colinear antennas with 6 to 9 dB gain in the horizontal plane. They pick up some data on any pass above about 5 degrees but perform very poorly on direct passes over about 40 degrees. Would anyone like to comment on weather an antenna pointing up (like the Q.H.)would copy more or less data if it can not see low elevation passes.

Thanks for any info!
--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

829. KO23 - what do the downlink messages mean?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-07 21:20:52 UTC
From: bmm1@freenet.scri.fsu.edu
Message-ID: <199406072110.AA21493@freenet3.scri.fsu.edu>
Source record: 27631

The 9600 baud sats downlink a lot of info all the time. The meaning of
some of it is obvious and some is not. Does anyone have a list of
typical messages and what they are all about?
--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

830. Satellite software

Newsgroup: rec.radio.amateur.space
Date: 1994-06-07 21:27:41 UTC
From: gap@pickburn.demon.co.uk
Message-ID: <3@pickburn.demon.co.uk>
Source record: 27638

Can anyone point me to an FTP source (or Gopher or whatever) for a satellite ephemeris prediction program for a Mac so that I can use the Keplerian elements I see on the Net?

Thanks in anticipation,

George Pickburn, G3XJK

831. Re: What SAT's can I hear on a Scanner ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-07 21:56:13 UTC
From: bmm1@freenet3.scri.fsu.edu
Message-ID: <2t2qdt$dih@freenet3.scri.fsu.edu>
Source record: 27632

GUMBYRAMA (gumbyrama@aol.com) wrote:
: I just rec'd my no-code Tech license and am very interested in the
: AMSAT's.
: I use STS Plus tracking software and have been tracking the AO-21
: bird and can hear it fairly well with a PRO 2006 and a RS Discone. I
: am becoming familiar with the procedures to operate with and am blown
: away by all this cool stuff.

: I also have a shortwave with usb/lsb.

: My main question is what other SAT's can i hear with my equipment
: now? I really would like to know what is out there before I choose
: my equipment

: Thanks in Advance. Brad

I have used a PRO-2006 to monitor all the low earth orbit Oscars and
weather sats. A mast mounted preamp is necessary for the 70cm
downlinks. The PRO-2006 is my *only* dowlink radio. I have made
several mods to it which allow me to demodulate 1200 psk and 9600 fsk.
It can be made to do automatic doppler compensation on the 9600 baud
sats. I have worked oscars 16,18,19,22,23&25 with it and have been
quite pleased. If you get to the point that you want more technical
details just let me know.

Bruce , N4USH
--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

832. Re: Quadrifilar helix ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-08 00:18:50 UTC
From: ANTONIO@qualcomm.com
Message-ID: <771034654.0.ANTONIO@NIKE.QUALCOMM.COM>
Source record: 27633

> I read Dave Guimont's article on quadrifilar helix antennas in the
> March/april Amsat journal. I would appreciate any info from anyone who
> has any additional info on these antennas.

Dave can be reached at g_dguimont@qualcomm.com .

----

833. RV3DR MIR QSL PATH?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-08 03:32:40 UTC
From: mpickard@netcom.com
Message-ID: <mpickardCr276p.Iq0@netcom.com>
Source record: 27635

Recently I worked MIR on packet and in the header from MIR they gave RV3DR as the QSL Manager however I couldn't find RV3DR in the 94 Callbook. Does anyone know RV3DR's address?

Thanks very much. This was my first space QSO and was extra special because my family was able to go outside and visually sight it as it passed over the Seattle area!

73,
Mike K7NPN
mpickard@netcom.com

834. Sats you can hear on a scanner

Newsgroup: rec.radio.amateur.space
Date: 1994-06-08 08:38:17 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <2t401p$q5b@usenet.INS.CWRU.Edu>
Source record: 27637

Here's my list of satellites that can be heard on a scanner:

Space Shuttle (when up) 145.55 voice
Mir 145.55 voice and packet
OSCAR-21 145.987 (use 145.985 or .990) voice,
packet, wefax
Dove 145.825 Packet and now voice too
AO-27 436.800 Voice. Weak! Use a six element
uhf beam ($50.00, can be hand-
held) Only operates in daylight
and usually only on weekends

Short Wave Radio Birds:
RS-10/11 29.360-29.400 SSB/CW CW Beacon: 29.357
RS-12/13 29.410-29.450 SSB/CW CW Beacon: 29.407

If you have accesss to packet, I put pass times for these birds
out weekly. Look for articles addressed to EZSATS.

Dave, N9LTD

835. Re: RV3DR MIR QSL PATH?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-08 12:42:36 UTC
From: sean@g0oanint.demon.co.uk
Message-ID: <28@g0oanint.demon.co.uk>
Source record: 27639

In article <mpickardCr276p.Iq0@netcom.com> mpickard@netcom.com (Mike Pickard) writes:
>Recently I worked MIR on packet and in the header from MIR they
>gave RV3DR as the QSL Manager however I couldn't find RV3DR in
>the 94 Callbook. Does anyone know RV3DR's address?

The qsl manager is: Sergei Samburov
P.O. 141070 box 73
Moscow Area
Kaliningrad-10 city
Russia

(It also helped to include a $1 bill and an envelope too)

836. Re: Satellite software

Newsgroup: rec.radio.amateur.space
Date: 1994-06-09 01:15:53 UTC
From: wy1z@bach.coe.neu.edu
Message-ID: <WY1Z.94Jun8211555@bach.coe.neu.edu>
Source record: 27640

In article <3@pickburn.demon.co.uk> gap@pickburn.demon.co.uk (George Pickburn) writes:

Newsgroups: rec.radio.amateur.space
Path: chaos.dac.neu.edu!grapevine.lcs.mit.edu!uhog.mit.edu!news.kei.com!eff!news.umbc.edu!
europa.eng.gtefsd.com!howland.reston.ans.net!EU.net!uknet!demon!news
From: gap@pickburn.demon.co.uk (George Pickburn)
Sender: news@demon.co.uk (Usenet Administration)
Nntp-Posting-Host: pickburn.demon.co.uk
Organization: pickburn
Date: Tue, 7 Jun 1994 21:27:41 GMT
Lines: 8

Can anyone point me to an FTP source (or Gopher or whatever) for a satellite
ephemeris prediction program for a Mac so that I can use the Keplerian elements
I see on the Net?

Thanks in anticipation,

George Pickburn, G3XJK

See if there is anything suitable for your needs via anonymous FTP at:
oak.oakland.edu /pub/hamradio/mac/space

You can also browse the Index files - /pub/hamradio/00-Index.txt and/or
/pub/hamradio/0-Index2.txt

73,
Scott
--

Scott Ehrlich, Amateur Radio Callsign: wy1z
How to reach me: wy1z@neu.edu [Internet], wy1z@wa1phy.ma [Packet]
Boston ARC ftp archives: ftp oak.oakland.edu /pub/hamradio
Boston ARC Web page: http://www.acs.oakland.edu/barc.html

837. Mir Help

Newsgroup: rec.radio.amateur.space
Date: 1994-06-09 04:19:44 UTC
From: anaylor@news.delphi.com
Message-ID: <2t6590$ohi@news.delphi.com>
Source record: 27641

I have a friend in New Zealand and I was wondering about corresponding through Mir. Is it like any other PBBS or does it have any special command sets. How long is an ordinary pass? Also, does anybody know of any good Macintosh tracking programs? I am in the process of ordering a AR-2 2M vertical, is this good for Mir? I have worked RS-10/11 and RS-12/13 And was figuring why stop there? TNX in advance. DE N0UJT A.K.A. ANAYLOR@DELPHI.COM

838. Jupiter Decametric Emissions

Newsgroup: rec.radio.amateur.space
Date: 1994-06-09 15:12:20 UTC
From: (unknown)
Message-ID: <1994Jun9.151220.19158@news2.den.mmc.com>
Source record: 27642

I will be monitoring the decametric frequencies during the upcoming Jupiter/SL9 encounter. I am looking for some more detail on the theory behind the emission sources. According to current predictions, there will be approximately a 3 hour delay between a fragment collision and the reception of any signals on Earth. Is the light time to Jupiter accounted for in this prediction? I'm also monitoring the usual decametric radio emissions (with some success) prior to the event. If a storm occurs and Jupiter sets at my location - shouldn't I be able to detect the storms if they occured prior to the setting time? Are the storms localized to a specific location on the planet?

Are the storms strong enough to penetrate the ionosphere with an MUF above my frequency or is this just impossible. Any help (replies, FTP sources) would be helpful.

-Al
toro@den.mmc.com

839. ORBS$161.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 04:30:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-161.o.1994@ampr.org>
Source record: 27644
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-161.O
Orbital Elements 161.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94150.69677441
Element set: 287
Inclination: 27.1154 deg
RA of node: 325.0714 deg
Eccentricity: 0.6022081
Arg of perigee: 182.4311 deg
Mean anomaly: 172.2849 deg
Mean motion: 2.05880205 rev/day
Decay rate: -6.1e-07 rev/day^2
Epoch rev: 8242
Checksum: 277

Satellite: UO-11
Catalog number: 14781
Epoch time: 94159.58005905
Element set: 699
Inclination: 97.7865 deg
RA of node: 174.7086 deg
Eccentricity: 0.0011152
Arg of perigee: 302.8221 deg
Mean anomaly: 57.1910 deg
Mean motion: 14.69217542 rev/day
Decay rate: 1.44e-06 rev/day^2
Epoch rev: 54904
Checksum: 315

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94159.90407672
Element set: 908
Inclination: 82.9230 deg
RA of node: 334.9649 deg
Eccentricity: 0.0013215
Arg of perigee: 50.4111 deg
```

Mean anomaly: 309.8211 deg
Mean motion: 13.72338053 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 34877
Checksum: 297

Satellite: AO-13
Catalog number: 19216
Epoch time: 94157.28362721
Element set: 923
Inclination: 57.7964 deg
RA of node: 248.7429 deg
Eccentricity: 0.7212622
Arg of perigee: 343.0560 deg
Mean anomaly: 1.9835 deg
Mean motion: 2.09726498 rev/day
Decay rate: -6.30e-06 rev/day^2
Epoch rev: 4578
Checksum: 328

Satellite: FO-20
Catalog number: 20480
Epoch time: 94157.45457424
Element set: 695
Inclination: 99.0344 deg
RA of node: 311.3041 deg
Eccentricity: 0.0541277
Arg of perigee: 3.8142 deg
Mean anomaly: 356.6842 deg
Mean motion: 12.83226187 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 20275
Checksum: 294

Satellite: AO-21
Catalog number: 21087
Epoch time: 94157.40570894
Element set: 477
Inclination: 82.9402 deg
RA of node: 150.6882 deg
Eccentricity: 0.0036807
Arg of perigee: 111.8581 deg
Mean anomaly: 248.6496 deg
Mean motion: 13.74540847 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16810
Checksum: 328

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94156.58678752

Element set: 698
Inclination: 82.9214 deg
RA of node: 20.0542 deg
Eccentricity: 0.0029669
Arg of perigee: 137.8770 deg
Mean anomaly: 222.4693 deg
Mean motion: 13.74041810 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 16705
Checksum: 321

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94148.14207754
Element set: 221
Inclination: 1.8240 deg
RA of node: 100.0387 deg
Eccentricity: 0.2920689
Arg of perigee: 182.3578 deg
Mean anomaly: 176.3320 deg
Mean motion: 1.42202262 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 91
Checksum: 254

/EX

840. ORBS$161.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 04:34:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-161.d.1994@ampr.org>
Source record: 27645
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-161.D
Orbital Elements 161.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94157.23861139
Element set: 0
Inclination: 98.5848 deg
RA of node: 242.1624 deg
Eccentricity: 0.0010423
Arg of perigee: 220.2693 deg
Mean anomaly: 139.7718 deg
Mean motion: 14.29844994 rev/day
Decay rate: -3.8e-07 rev/day^2
Epoch rev: 22802
Checksum: 304

Satellite: AO-16
Catalog number: 20439
Epoch time: 94156.73481228
Element set: 799
Inclination: 98.5957 deg
RA of node: 242.8851 deg
Eccentricity: 0.0010618
Arg of perigee: 223.5361 deg
Mean anomaly: 136.4969 deg
Mean motion: 14.29899297 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 22796
Checksum: 359

Satellite: DO-17
Catalog number: 20440
Epoch time: 94156.76023471
Element set: 799
Inclination: 98.5973 deg
RA of node: 243.2299 deg
Eccentricity: 0.0010714
Arg of perigee: 222.5466 deg
```

Mean anomaly: 137.4883 deg
Mean motion: 14.30038782 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 22798
Checksum: 328

Satellite: WO-18
Catalog number: 20441
Epoch time: 94157.22514543
Element set: 801
Inclination: 98.5958 deg
RA of node: 243.6917 deg
Eccentricity: 0.0011334
Arg of perigee: 221.5982 deg
Mean anomaly: 138.4365 deg
Mean motion: 14.30012443 rev/day
Decay rate: -8.1e-07 rev/day^2
Epoch rev: 22805
Checksum: 288

Satellite: LO-19
Catalog number: 20442
Epoch time: 94157.20405622
Element set: 798
Inclination: 98.5980 deg
RA of node: 243.9234 deg
Eccentricity: 0.0011512
Arg of perigee: 222.2726 deg
Mean anomaly: 137.7572 deg
Mean motion: 14.30108993 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 22806
Checksum: 297

Satellite: UO-22
Catalog number: 21575
Epoch time: 94157.69084411
Element set: 502
Inclination: 98.4354 deg
RA of node: 232.4004 deg
Eccentricity: 0.0007618
Arg of perigee: 329.4237 deg
Mean anomaly: 30.6509 deg
Mean motion: 14.36917795 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 15157
Checksum: 302

Satellite: KO-23
Catalog number: 22077
Epoch time: 94158.44314725

Element set: 397
Inclination: 66.0817 deg
RA of node: 300.3826 deg
Eccentricity: 0.0014038
Arg of perigee: 289.0245 deg
Mean anomaly: 70.9248 deg
Mean motion: 12.86286506 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8553
Checksum: 312

Satellite: AO-27
Catalog number: 22825
Epoch time: 94157.72326327
Element set: 296
Inclination: 98.6523 deg
RA of node: 233.6335 deg
Eccentricity: 0.0007784
Arg of perigee: 242.3709 deg
Mean anomaly: 117.6684 deg
Mean motion: 14.27625201 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 3619
Checksum: 313

Satellite: IO-26
Catalog number: 22826
Epoch time: 94157.21446021
Element set: 296
Inclination: 98.6522 deg
RA of node: 233.1665 deg
Eccentricity: 0.0008350
Arg of perigee: 244.4511 deg
Mean anomaly: 115.5800 deg
Mean motion: 14.27729220 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 3612
Checksum: 270

Satellite: KO-25
Catalog number: 22830
Epoch time: 94157.71795359
Element set: 301
Inclination: 98.5510 deg
RA of node: 231.0277 deg
Eccentricity: 0.0011336
Arg of perigee: 203.1377 deg
Mean anomaly: 156.9297 deg
Mean motion: 14.28055571 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 3620

```
Checksum: 286

/EX
```

841. ORBS$161.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 04:39:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-161.w.1994@ampr.org>
Source record: 27646
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-161.W
Orbital Elements 161.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94159.89024788
Element set: 833
Inclination: 99.0539 deg
RA of node: 210.2838 deg
Eccentricity: 0.0014080
Arg of perigee: 242.7480 deg
Mean anomaly: 117.2273 deg
Mean motion: 14.13620276 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 48917
Checksum: 321

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94159.94159500
Element set: 732
Inclination: 98.5100 deg
RA of node: 169.1973 deg
Eccentricity: 0.0013720
Arg of perigee: 358.6589 deg
Mean anomaly: 1.4551 deg
Mean motion: 14.24888833 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 40143
Checksum: 321

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94158.84525915
Element set: 305
Inclination: 82.5399 deg
RA of node: 276.0117 deg
Eccentricity: 0.0015611
Arg of perigee: 203.5072 deg
```

Mean anomaly: 156.5376 deg
Mean motion: 13.84716189 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 32106
Checksum: 305

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94159.88197195
Element set: 294
Inclination: 82.5397 deg
RA of node: 329.5606 deg
Eccentricity: 0.0016070
Arg of perigee: 286.8557 deg
Mean anomaly: 73.0807 deg
Mean motion: 13.16967913 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28216
Checksum: 345

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94159.92765754
Element set: 653
Inclination: 99.1718 deg
RA of node: 148.6353 deg
Eccentricity: 0.0011863
Arg of perigee: 152.0390 deg
Mean anomaly: 208.1421 deg
Mean motion: 14.12992576 rev/day
Decay rate: 1.25e-06 rev/day^2
Epoch rev: 29405
Checksum: 314

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94156.51345801
Element set: 294
Inclination: 82.5167 deg
RA of node: 153.2269 deg
Eccentricity: 0.0012537
Arg of perigee: 260.2043 deg
Mean anomaly: 99.7701 deg
Mean motion: 13.84365397 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 26607
Checksum: 312

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94159.25725234

Element set: 68
Inclination: 82.5552 deg
RA of node: 276.1489 deg
Eccentricity: 0.0005929
Arg of perigee: 323.3208 deg
Mean anomaly: 36.7508 deg
Mean motion: 13.04422019 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22173
Checksum: 287

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94157.67818155
Element set: 799
Inclination: 82.5475 deg
RA of node: 216.8127 deg
Eccentricity: 0.0015578
Arg of perigee: 170.2858 deg
Mean anomaly: 189.8605 deg
Mean motion: 13.84188682 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 19916
Checksum: 368

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94159.54859903
Element set: 988
Inclination: 98.8329 deg
RA of node: 179.9524 deg
Eccentricity: 0.0016338
Arg of perigee: 35.2398 deg
Mean anomaly: 324.9843 deg
Mean motion: 14.01351703 rev/day
Decay rate: 2.85e-06 rev/day^2
Epoch rev: 19249
Checksum: 359

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94157.46205984
Element set: 807
Inclination: 82.5253 deg
RA of node: 154.5153 deg
Eccentricity: 0.0015154
Arg of perigee: 76.7190 deg
Mean anomaly: 283.5664 deg
Mean motion: 13.83582339 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 18627

Checksum: 323

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94156.99788935
Element set: 705
Inclination: 82.5415 deg
RA of node: 177.5026 deg
Eccentricity: 0.0011846
Arg of perigee: 211.6813 deg
Mean anomaly: 148.3605 deg
Mean motion: 13.16462992 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14988
Checksum: 323

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94159.96392273
Element set: 57
Inclination: 98.6185 deg
RA of node: 187.9223 deg
Eccentricity: 0.0011859
Arg of perigee: 261.5487 deg
Mean anomaly: 98.4345 deg
Mean motion: 14.22414262 rev/day
Decay rate: 1.57e-06 rev/day^2
Epoch rev: 15936
Checksum: 332

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94156.88810524
Element set: 714
Inclination: 82.5508 deg
RA of node: 124.7250 deg
Eccentricity: 0.0011681
Arg of perigee: 224.6140 deg
Mean anomaly: 135.4044 deg
Mean motion: 13.16830633 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13497
Checksum: 281

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94157.22615171
Element set: 307
Inclination: 82.5494 deg
RA of node: 215.1192 deg
Eccentricity: 0.0020724

```
Arg of perigee: 257.2687 deg
Mean anomaly: 102.6153 deg
Mean motion: 13.83008098 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 3857
Checksum: 288

/EX
```

842. ORBS$161.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 04:42:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-161.m.1994@ampr.org>
Source record: 27643
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-161.M
Orbital Elements 161.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94157.72294064
Element set: 289
Inclination: 98.6496 deg
RA of node: 233.6944 deg
Eccentricity: 0.0009240
Arg of perigee: 227.5945 deg
Mean anomaly: 132.4448 deg
Mean motion: 14.28028083 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 3620
Checksum: 317

Satellite: MIR
Catalog number: 16609
Epoch time: 94159.91476795
Element set: 636
Inclination: 51.6469 deg
RA of node: 227.7363 deg
Eccentricity: 0.0002167
Arg of perigee: 29.8936 deg
Mean anomaly: 330.2213 deg
Mean motion: 15.56279933 rev/day
Decay rate: 5.86e-06 rev/day^2
Epoch rev: 47475
Checksum: 346

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94158.51049335
Element set: 494
Inclination: 28.4699 deg
RA of node: 298.1316 deg
Eccentricity: 0.0006090
Arg of perigee: 348.7925 deg
```

Mean anomaly: 11.2530 deg
Mean motion: 14.90619514 rev/day
Decay rate: 4.75e-06 rev/day^2
Epoch rev: 2794
Checksum: 309

Satellite: GRO
Catalog number: 21225
Epoch time: 94157.52483587
Element set: 105
Inclination: 28.4623 deg
RA of node: 306.1697 deg
Eccentricity: 0.0003383
Arg of perigee: 95.4692 deg
Mean anomaly: 264.6295 deg
Mean motion: 15.40894106 rev/day
Decay rate: 2.122e-05 rev/day^2
Epoch rev: 5529
Checksum: 303

Satellite: UARS
Catalog number: 21701
Epoch time: 94159.22695472
Element set: 538
Inclination: 56.9851 deg
RA of node: 194.9643 deg
Eccentricity: 0.0005895
Arg of perigee: 100.7728 deg
Mean anomaly: 259.3969 deg
Mean motion: 14.96500170 rev/day
Decay rate: -2.951e-05 rev/day^2
Epoch rev: 14959
Checksum: 344

/EX

843. ORBS$161.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 04:45:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-161.n.1994@ampr.org>
Source record: 27647
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-161.N
2Line Orbital Elements 161.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94150.69677441 -.00000061 00000-0 10000-3 0 2876
2 14129 27.1154 325.0714 6022081 182.4311 172.2849 2.05880205 82429
UO-11
1 14781U 84021B 94159.58005905 .00000144 00000-0 32323-4 0 6999
2 14781 97.7865 174.7086 0011152 302.8221 57.1910 14.69217542549042
RS-10/11
1 18129U 87054A 94159.90407672 .00000044 00000-0 31226-4 0 9084
2 18129 82.9230 334.9649 0013215 50.4111 309.8211 13.72338053348777
AO-13
1 19216U 88051B 94157.28362721 -.00000630 00000-0 10000-4 0 9230
2 19216 57.7964 248.7429 7212622 343.0560 1.9835 2.09726498 45785
FO-20
1 20480U 90013C 94157.45457424 .00000028 00000-0 13632-3 0 6959
2 20480 99.0344 311.3041 0541277 3.8142 356.6842 12.83226187202752
AO-21
1 21087U 91006A 94157.40570894 .00000094 00000-0 82657-4 0 4773
2 21087 82.9402 150.6882 0036807 111.8581 248.6496 13.74540847168102
RS-12/13
1 21089U 91007A 94156.58678752 .00000043 00000-0 29790-4 0 6984
2 21089 82.9214 20.0542 0029669 137.8770 222.4693 13.74041810167052
ARSENE
1 22654U 93 31 B 94148.14207754 -.00000051 00000-0 00000 0 0 2215
2 22654 1.8240 100.0387 2920689 182.3578 176.3320 1.42202262 918
UO-14
1 20437U 90005B 94157.23861139 -.00000038 00000-0 21101-5 0 04
2 20437 98.5848 242.1624 0010423 220.2693 139.7718 14.29844994228029
AO-16
1 20439U 90005D 94156.73481228 .00000030 00000-0 28514-4 0 7997
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2 20439 98.5957 242.8851 0010618 223.5361 136.4969 14.29899297227965
DO-17
1 20440U 90005E 94156.76023471 .00000036 00000-0 31082-4 0 7994
2 20440 98.5973 243.2299 0010714 222.5466 137.4883 14.30038782227982
WO-18
1 20441U 90005F 94157.22514543 -.00000081 00000-0 -14246-4 0 8011
2 20441 98.5958 243.6917 0011334 221.5982 138.4365 14.30012443228059
LO-19
1 20442U 90005G 94157.20405622 .00000024 00000-0 26325-4 0 7988
2 20442 98.5980 243.9234 0011512 222.2726 137.7572 14.30108993228061
UO-22
1 21575U 91050B 94157.69084411 .00000043 00000-0 29134-4 0 5024
2 21575 98.4354 232.4004 0007618 329.4237 30.6509 14.36917795151576
KO-23
1 22077U 92052B 94158.44314725 -.00000037 00000-0 10000-3 0 3970
2 22077 66.0817 300.3826 0014038 289.0245 70.9248 12.86286506 85531
AO-27
1 22825U 93061C 94157.72326327 .00000005 00000-0 19869-4 0 2968
2 22825 98.6523 233.6335 0007784 242.3709 117.6684 14.27625201 36194
IO-26
1 22826U 93061D 94157.21446021 .00000023 00000-0 27093-4 0 2965
2 22826 98.6522 233.1665 0008350 244.4511 115.5800 14.27729220 36125
KO-25
1 22830U 93061H 94157.71795359 .00000011 00000-0 21962-4 0 3019
2 22830 98.5510 231.0277 0011336 203.1377 156.9297 14.28055571 36202
NOAA-9
1 15427U 84123A 94159.89024788 .00000083 00000-0 68045-4 0 8336
2 15427 99.0539 210.2838 0014080 242.7480 117.2273 14.13620276489174
NOAA-10
1 16969U 86073A 94159.94159500 .00000066 00000-0 46351-4 0 7326
2 16969 98.5100 169.1973 0013720 358.6589 1.4551 14.24888833401436
MET-2/17
1 18820U 88005A 94158.84525915 .00000041 00000-0 23141-4 0 3057
2 18820 82.5399 276.0117 0015611 203.5072 156.5376 13.84716189321067
MET-3/2
1 19336U 88064A 94159.88197195 .00000051 00000-0 10000-3 0 2942
2 19336 82.5397 329.5606 0016070 286.8557 73.0807 13.16967913282164
NOAA-11
1 19531U 88089A 94159.92765754 .00000125 00000-0 92190-4 0 6535
2 19531 99.1718 148.6353 0011863 152.0390 208.1421 14.12992576294059
MET-2/18
1 19851U 89018A 94156.51345801 .00000022 00000-0 66163-5 0 2941
2 19851 82.5167 153.2269 0012537 260.2043 99.7701 13.84365397266071
MET-3/3
1 20305U 89086A 94159.25725234 .00000044 00000-0 10000-3 0 688
2 20305 82.5552 276.1489 0005929 323.3208 36.7508 13.04422019221732
MET-2/19
1 20670U 90057A 94157.67818155 .00000038 00000-0 20767-4 0 7998
2 20670 82.5475 216.8127 0015578 170.2858 189.8605 13.84188682199164
FY-1/2
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1 20788U 90081A 94159.54859903 .00000285 00000-0 21713-3 0 9884
2 20788 98.8329 179.9524 0016338 35.2398 324.9843 14.01351703192497
MET-2/20
1 20826U 90086A 94157.46205984 .00000049 00000-0 30983-4 0 8073
2 20826 82.5253 154.5153 0015154 76.7190 283.5664 13.83582339186278
MET-3/4
1 21232U 91030A 94156.99788935 .00000050 00000-0 10000-3 0 7050
2 21232 82.5415 177.5026 0011846 211.6813 148.3605 13.16462992149887
NOAA-12
1 21263U 91032A 94159.96392273 .00000157 00000-0 89986-4 0 570
2 21263 98.6185 187.9223 0011859 261.5487 98.4345 14.22414262159367
MET-3/5
1 21655U 91056A 94156.88810524 .00000051 00000-0 10000-3 0 7146
2 21655 82.5508 124.7250 0011681 224.6140 135.4044 13.16830633134975
MET-2/21
1 22782U 93055A 94157.22615171 .00000040 00000-0 22931-4 0 3072
2 22782 82.5494 215.1192 0020724 257.2687 102.6153 13.83008098 38579
POSAT
1 22829U 93061G 94157.72294064 .00000046 00000-0 36383-4 0 2891
2 22829 98.6496 233.6944 0009240 227.5945 132.4448 14.28028083 36200
MIR
1 16609U 86017A 94159.91476795 .00000586 00000-0 15049-4 0 6360
2 16609 51.6469 227.7363 0002167 29.8936 330.2213 15.56279933474759
HUBBLE
1 20580U 90037B 94158.51049335 .00000475 00000-0 32164-4 0 4947
2 20580 28.4699 298.1316 0006090 348.7925 11.2530 14.90619514 27942
GRO
1 21225U 91027B 94157.52483587 .00002122 00000-0 44012-4 0 1050
2 21225 28.4623 306.1697 0003383 95.4692 264.6295 15.40894106 55296
UARS
1 21701U 91063B 94159.22695472 -.00002951 00000-0 -23660-3 0 5383
2 21701 56.9851 194.9643 0005895 100.7728 259.3969 14.96500170149599
/EX
```

844. Jupiter Decametric Emissions

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 13:07:42 UTC
From: neill.p.taylor@aea.ORGn.UK
Message-ID: <9406101307.AA21477@fusrs3b.culham.aea.orgn.uk>
Source record: 27648

Al <toro@den.mmc.com> wrote:

>I will be monitoring the decametric frequencies during the upcoming
>Jupiter/SL9 encounter. I am looking for some more detail on the theory
>behind the emission sources.
[.....]

Check out the article on this subject by Geoff Grayer G3NAQ in the June 1994 issue of "Radio Communication", the journal of the Radio Society of Great Britain. Geoff is also asking for logs and recordings of the activity for the RSGB Propogation Studies Committee.
You might also look at the newsgroup sci.astro.

73, Neill G4HLX

Neill Taylor UKAEA Government Division
Fusion
D3 Culham, Abingdon, Oxon. OX14 3DB, UK.
Internet: neill.p.taylor@aea.orgn.uk
Packet: G4HLX@GB7SDN.#49.GBR.EU
AMPRnet: g4hlx@g4hlx.ampr.org
---

845. Re: Satellite software

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 18:13:51 UTC
From: bmm1@freenet3.scri.fsu.edu
Message-ID: <2taagv$38l@freenet3.scri.fsu.edu>
Source record: 27650

George Pickburn (gap@pickburn.demon.co.uk) wrote:

: Can anyone point me to an FTP source (or Gopher or whatever) for a satellite
: ephemeris prediction program for a Mac so that I can use the Keplerian elements
: I see on the Net?

: Thanks in anticipation,

: George Pickburn, G3XJK

There is a Mac satellite tracker available from Amsat at a reasonable
cost. The procedes from the sale of the software helps ensure that
there are satellites to track! I thing all the really good software
has been donated to the cause.

Bruce.
--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

846. Two-Line Orbital Element Sets (TLE411)

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 19:03:38 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.771275018@afit.af.mil>
Source record: 27649

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #411 -
Alouette 1
1 00424U 62049 94159.42289219 .00000053 00000-0 52245-4 0 10
2 00424 80.4628 293.6459 0023994 135.8514 224.4548 13.67811524581205
ATS 1
1 02608U 66110A 94159.68206360 -.00000280 00000-0 10000-3 0 8779
2 02608 14.5491 0.5140 0010450 44.7844 22.5439 1.00381263 17381
ATS 3
1 03029U 67111A 94157.38137800 -.00000114 00000-0 10000-3 0 2024
2 03029 14.6445 7.5800 0009338 265.7175 13.2706 1.00272958 97320
Cosmos 398
1 04966U 71016A 94160.51299632 .00095590 68221-5 19040-3 0 2708
2 04966 51.4521 0.1450 1034993 341.3010 15.2657 13.86300233771680
Starlette
1 07646U 75010A 94159.83628263 -.00000130 00000-0 90820-5 0 7887
2 07646 49.8257 186.3121 0205850 308.5323 49.7275 13.82186644976690
LAGEOS
1 08820U 76039A 94159.96269612 .00000004 00000-0 10000-3 0 25
2 08820 109.8195 132.7837 0044240 286.9139 72.6511 6.38664360166621
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94160.26923786 .00000080 00000-0 00000+0 0 3459
2 10061 11.1845 45.8061 0001850 352.4044 179.9735 1.00263978 7037
IUE
1 10637U 78012A 94159.73015480 -.00000237 00000-0 10000-3 0 90
2 10637 34.5636 94.9888 1315102 35.6963 340.2083 1.00270125 12648
GPS BI-01
1 10684U 78020A 94157.63324875 -.00000055 00000-0 10000-3 0 2741
2 10684 64.6387 45.8280 0062703 163.5250 196.7313 1.98069637104725
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GPS BI-02
1 10893U 78047A 94154.36645690 -.00000072 00000-0 10000-3 0 725
2 10893 63.5550 284.8761 0214029 13.8255 346.7302 2.01627339117798
GOES 3
1 10953U 78062A 94158.44262711 .00000079 00000-0 10000-3 0 3146
2 10953 10.1206 48.5788 0003866 90.4768 102.4166 1.00283325 11621
SeaSat 1
1 10967U 78064A 94160.18878453 -.00000028 00000-0 35379-4 0 2964
2 10967 107.9960 85.6662 0002579 265.4765 94.6083 14.37959693835213
GPS BI-03
1 11054U 78093A 94155.32766194 -.00000077 00000-0 10000-3 0 1889
2 11054 63.2394 282.1290 0043959 176.0645 183.9551 1.93505236114263
Nimbus 7
1 11080U 78098A 94159.70702920 -.00000102 00000-0 -53940-4 0 4015
2 11080 99.0548 43.6565 0009113 150.9344 209.2319 13.83732242788909
GPS BI-04
1 11141U 78112A 94154.88230897 -.00000081 00000-0 00000+0 0 8870
2 11141 64.6370 47.1158 0048568 25.4251 334.8494 1.92894909 3528
GPS BI-05
1 11690U 80011A 94158.93695987 -.00000041 00000-0 10000-3 0 7943
2 11690 64.9784 47.5649 0142040 196.2620 163.3447 2.00555824119357
GPS BI-06
1 11783U 80032A 94157.67455292 -.00000060 00000-0 10000-3 0 9787
2 11783 62.6524 278.5788 0210125 29.3001 331.8639 2.03456345103748
GOES 5
1 12472U 81049A 94149.94702009 .00000056 00000-0 10000-3 0 7719
2 12472 6.7860 58.2175 0006553 10.9465 25.3580 1.00313779 5589
Cosmos 1383
1 13301U 82066A 94158.88887357 .00000038 00000-0 26222-4 0 2993
2 13301 82.9285 316.5710 0028708 118.2397 242.1657 13.68056102596158
LandSat 4
1 13367U 82072A 94157.28099816 .00000033 00000-0 17427-4 0 4961
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RS-12/13
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2 22057 64.9337 349.2016 0006863 330.5339 29.4585 2.13103598 14419
Glonass 58
1 22058U 92047C 94160.16825678 -.00000040 00000-0 00000+0 0 8951
2 22058 64.9333 349.2112 0008260 279.6940 80.2402 2.13103239 14467
TOPEX
1 22076U 92052A 94157.03073961 -.00000038 00000-0 10000-3 0 7691
2 22076 66.0435 314.1729 0007492 264.7847 95.2329 12.80929893 85060
KO-23
1 22077U 92052B 94158.44314725 -.00000037 00000-0 10000-3 0 3970
2 22077 66.0817 300.3826 0014038 289.0245 70.9248 12.86286506 85531
S80/T
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1 22078U 92052C 94157.83136335 -.00000037 00000-0 10000-3 0 3950
2 22078 66.0814 300.9592 0015709 290.7400 69.1935 12.86568546 85522
GPS BIIA-15
1 22108U 92058A 94159.50381124 -.00000022 00000-0 10000-3 0 4139
2 22108 54.3399 257.8349 0107696 139.2314 221.6202 2.00554672 12759
FREJA
1 22161U 92064A 94156.56995877 -.00000017 00000-0 40396-4 0 4095
2 22161 63.0025 322.0847 0783537 314.1136 39.7895 13.21763347 80262
LAGEOS II
1 22195U 92070B 94159.48627738 -.00000009 00000-0 10000-3 0 3011
2 22195 52.6490 99.1700 0138987 113.5324 247.9904 6.47294088 38383
GPS BIIA-16
1 22231U 92079A 94156.20144725 .00000064 00000-0 00000+0 0 4092
2 22231 54.7233 199.4670 0036110 295.0107 64.6536 2.00557028 11266
GPS BIIA-17
1 22275U 92089A 94155.34649172 .00000060 00000-0 00000+0 0 4154
2 22275 54.6516 197.0263 0053103 255.2043 104.2958 2.00562128 10655
TDRS 5
1 22314U 93003B 94155.38651285 -.00000277 00000-0 10000-3 0 4007
2 22314 1.0278 74.2689 0003594 30.9171 240.4084 1.00277080 5192
GPS BIIA-18
1 22446U 93007A 94158.90729779 -.00000079 00000-0 00000+0 0 4074
2 22446 54.6728 317.6883 0071078 347.3165 12.4851 2.00571868 9715
Glonass 59
1 22512U 93010A 94156.39535712 .00000006 00000-0 00000+0 0 5873
2 22512 64.9103 109.3366 0008586 208.5857 151.3546 2.13102212 9869
Glonass 60
1 22513U 93010B 94159.15111160 .00000005 00000-0 00000+0 0 5990
2 22513 64.9045 109.2627 0006912 210.1866 149.7406 2.13102614 10116
Glonass 61
1 22514U 93010C 94159.38719551 .00000006 00000-0 00000+0 0 5816
2 22514 64.9182 109.2433 0013190 198.3615 161.5583 2.13101505 10126
ASTRO-D
1 22521U 93011A 94159.13565308 .00000619 00000-0 47231-4 0 2995
2 22521 31.1028 132.8066 0075994 4.0499 356.0740 14.93225351 70743
UFO F1
1 22563U 93015A 94157.10334645 -.00000233 00000-0 10000-3 0 2927
2 22563 26.6693 299.9486 0001741 223.5058 75.3693 0.99250630 8721
GPS BIIA-19
1 22581U 93017A 94155.05877701 -.00000088 00000-0 10000-3 0 3071
2 22581 55.1232 18.1022 0048395 35.0471 325.3128 2.00566790 8693
ARSENE
1 22654U 93031B 94148.14207755 -.00000130 00000-0 00000+0 0 2618
2 22654 1.8240 100.0387 2920689 182.3578 176.3320 1.42202262 918
GPS BIIA-20
1 22657U 93032A 94157.18995979 -.00000075 00000-0 00000+0 0 3202
2 22657 55.1538 17.8389 0062573 206.2128 153.5420 2.00556723 4061
RADCAL
1 22698U 93041A 94156.43904581 .00000044 00000-0 14152-4 0 3037
2 22698 89.5453 309.9990 0088943 225.1710 134.2219 14.21311929 48920
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GPS BIIA-21
1 22700U 93042A 94157.65182888 -.00000042 00000-0 10000-3 0 3019
2 22700 54.5282 258.6271 0027306 320.4426 39.3670 2.00552787 6874
NOAA 13
1 22739U 93050A 94160.84137409 -.00000048 00000-0 -18325-5 0 4562
2 22739 98.9477 105.2594 0010119 136.9447 223.2523 14.10897684 42925
GPS BIIA-22
1 22779U 93054A 94159.73566053 -.00000076 00000-0 10000-3 0 3364
2 22779 54.7994 317.5756 0022286 227.6683 132.1399 2.00571309 5678
Meteor 2-21
1 22782U 93055A 94157.22615171 .00000040 00000-0 22931-4 0 3072
2 22782 82.5494 215.1192 0020724 257.2687 102.6153 13.83008098 38579
UFO F2
1 22787U 93056A 94156.01426810 -.00000061 00000-0 10000-3 0 2834
2 22787 4.8451 323.4510 0004815 84.1825 282.1959 1.00266746 1137
SPOT 3
1 22823U 93061A 94159.41442971 -.00000005 00000-0 18151-4 0 3154
2 22823 98.7149 234.0312 0001134 88.8619 271.2666 14.20034562 36243
STELLA
1 22824U 93061B 94158.16428817 -.00000039 00000-0 21441-5 0 2961
2 22824 98.6564 233.9667 0005591 243.8712 116.1897 14.27096975 36249
AO-27
1 22825U 93061C 94157.72326327 .00000005 00000-0 19869-4 0 2968
2 22825 98.6523 233.6335 0007784 242.3709 117.6684 14.27625201 36194
IO-26
1 22826U 93061D 94157.21446021 .00000023 00000-0 27093-4 0 2965
2 22826 98.6522 233.1665 0008350 244.4511 115.5800 14.27729220 36125
HEATHSAT
1 22827U 93061E 94158.24706892 .00000047 00000-0 36728-4 0 3585
2 22827 98.6516 234.1658 0008753 233.8688 126.1673 14.27839877 36278
PO-28
1 22829U 93061G 94157.72294064 .00000046 00000-0 36383-4 0 2891
2 22829 98.6496 233.6944 0009240 227.5945 132.4448 14.28028083 36200
KO-25
1 22830U 93061H 94157.71795359 .00000011 00000-0 21962-4 0 3019
2 22830 98.5510 231.0277 0011336 203.1377 156.9297 14.28055571 36202
GPS BIIA-23
1 22877U 93068A 94159.78860329 -.00000038 00000-0 10000-3 0 1283
2 22877 55.2005 78.7783 0032412 291.7087 67.9030 2.00577037 4562
METEOSAT 6
1 22912U 93073B 94160.21406888 -.00000074 00000-0 00000+0 0 919
2 22912 0.9072 267.2484 0001873 242.3532 174.9821 1.00273882 440
HST Array
1 22920U 90037C 94157.52785825 .00004441 00000-0 36535-3 0 1521
2 22920 28.4751 295.7540 0003574 138.3576 221.7231 14.96802120 27895
Soyuz TM-18
1 22957U 94001A 94159.91477287 .00009011 00000-0 13241-3 0 1450
2 22957 51.6464 227.7432 0002981 30.9835 329.1663 15.56292896 23679
Meteor 3-6
1 22969U 94003A 94156.23169532 .00000051 00000-0 10000-3 0 698
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2 22969 82.5624 64.6971 0014512 300.1228 59.8461 13.16722326 17272
TUBSAT-B
1 22970U 94003B 94157.81712376 .00000051 00000-0 10000-3 0 594
2 22970 82.5614 63.5615 0014839 292.4703 67.4840 13.16821446 17481
1994004C
1 22987U 94004C 94098.46584220 -.00000666 00000-0 00000+0 0 74
2 22987 66.5360 59.3960 9045772 202.2990 31.7820 0.46869300 14
ODERACS A
1 22990U 94006B 94157.81335764 .00057604 11537-4 21105-3 0 945
2 22990 56.9892 14.5555 0019729 130.7483 229.6011 15.88524211 18526
ODERACS B
1 22991U 94006C 94159.98524054 .00058705 11576-4 21814-3 0 941
2 22991 56.9835 4.8912 0016454 130.2340 230.0225 15.88326369 18866
ODERACS E
1 22994U 94006F 94155.77565473 .00022854 00000-0 12030-3 0 781
2 22994 56.9962 27.0915 0014586 112.0336 248.1649 15.80557673 18155
ODERACS F
1 22995U 94006G 94159.69691140 .00023708 00000-0 12253-3 0 975
2 22995 56.9865 9.2132 0018377 133.6666 226.5928 15.80842349 18773
BREMSAT
1 22998U 94006H 94158.06428259 .00024407 00000-0 13175-3 0 811
2 22998 56.9895 17.4770 0014619 134.1972 226.0304 15.79958962 18353
GPS BIIA-24
1 23027U 94016A 94159.86594352 -.00000062 00000-0 00000+0 0 566
2 23027 54.9686 19.8199 0061510 190.8925 169.0303 2.00558534 1878
Glonass 62
1 23043U 94021A 94156.70721995 -.00000043 00000-0 00000+0 0 553
2 23043 64.8121 349.7676 0005673 172.6876 187.3602 2.13103148 1186
Glonass 63
1 23044U 94021B 94156.59014129 -.00000044 00000-0 00000+0 0 365
2 23044 64.8022 349.7788 0027974 201.4508 158.4773 2.13103431 1185
Glonass 64?
1 23045U 94021C 94156.23461005 -.00000044 00000-0 00000+0 0 366
2 23045 64.8115 349.7919 0007238 193.6775 166.3412 2.13120154 1172
GOES 8
1 23051U 94022A 94159.73429173 -.00000172 00000-0 00000+0 0 1084
2 23051 0.3687 267.7701 0034091 47.2480 115.5638 1.00275954 203
STEP 2
1 23105U 94029A 94156.54256368 .00000488 00000-0 94497-4 0 122
2 23105 81.9592 180.5381 0153502 0.0257 0.0904 14.54223646 2454
1994029B
1 23106U 94029B 94156.50553130 .00000143 00000-0 22139-4 0 94
2 23106 81.9591 180.4883 0168566 0.3660 359.7619 14.57431013 2456
Gorizont 30
1 23108U 94030A 94160.07815568 -.00000249 00000-0 00000+0 0 277
2 23108 1.3340 278.3750 0001516 249.1876 260.7300 1.00298904 224
1994030D
1 23111U 94030D 94155.21407494 -.00000128 00000-0 00000+0 0 92
2 23111 1.3488 277.9121 0046266 32.9396 301.7374 1.03841536 151
ProgressM23
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1 23114U 94031A 94159.91477287 .00009011 00000-0 13241-3 0 223
2 23114 51.6464 227.7432 0002981 30.9835 329.1663 15.56292896 2762
1994030E
1 23116U 94030E 94156.41824848 .00000188 00000-0 21489-3 0 66
2 23116 47.3552 272.3371 7232554 4.3132 359.5090 2.33411851 411
1994030F
1 23117U 94030F 94156.44562155 -.00000056 00000-0 14928-3 0 65
2 23117 47.3920 272.3443 7209180 4.4901 359.4083 2.33003509 413
1993073E
1 23118U 93 73 E 94150.37883330 -.00000275 00000-0 00000+0 0 19
2 23118 0.9865 270.2950 0065470 338.4488 280.8293 0.99998024 439
1994032A
1 23119U 94032A 94161.28385755 .00063068 39128-6 92842-4 0 158
2 23119 82.5789 29.2626 0043715 90.8385 269.7874 16.02913550 484
1994032B
1 23120U 94032B 94160.87332347 .14581342 -12156-5 23654-3 0 176
2 23120 82.5687 29.6703 0006429 111.5145 249.6427 16.48091029 422
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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847. Online Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-06-10 23:31:17 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <2tat45$qfc@news.CCIT.Arizona.EDU>
Source record: 27651

Dear Colleague:

Student Space Action would like to inform you of a way in which you can directly voice your support for manned space exploration. As you read this, your space program is in danger of becoming extinct. Congress is once again attempting to eliminate space station funding. Cancellation of the space station could mean the phase-out of space exploration and eventual termination of aerospace industries and job opportunities. The resulting impact on the nation's economy, technology and educational system would be disastrous.

You can tell your congressmen exactly how much you support the space station and the manned space initiative by signing the Student Space Action's Interactive Online Petition. Simply follow these steps:

telnet seds.lpl.arizona.edu
login> space

Now answer the questions to the best of your ability
(read the directions accompanying the petition--
use <tab> to enter answer; <enter> to toggle yes/no;
up/down arrows to go backwards and forwards through
questions. Caution: if floating characters appear on
your screen--ignore--it's probably just an emulation
problem. Your petition will still be signed.

After you submit the petition, you will receive information
on your congressmen and senators so you can contact them further
by phone or mail if you desire.

The petition is also accessible by NCSA Mosaic. Simply go to the following
URL and follow the directions:

URL: http://seds.lpl.arizona.edu/ssa/petition.html

Answer the questions and submit the petition and you
will receive the same information as the telnet version.
You will also have the option of linking to the space
station home page where you can read up-to-date information
on the space station, including issues of "Space Station
This Week."

Please forward this message to anyone you may feel would want to be a part
of this effort--everyone!

If you believe the space program is a vital part of our country's future,
both in economic growth and technological advancement, then sign the

Student Space Action's Interactive Petition.

If you believe that NASA should remain as an engine for continued manned space exploration, then tell everyone you know to sign this petition.

If you believe that our government, by supporting an initiative like the space station, is making an investment in the future generation of this great nation, then send your message to Washington by signing the Student Space Action Interactive Petition.

SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

Student Space Action
ssa@seds.lpl.arizona.edu

848. Sat reception

Newsgroup: rec.radio.amateur.space
Date: 1994-06-11 00:46:05 UTC
From: wa4ymz@aol.com
Message-ID: <2tb1gd$89q@search01.news.aol.com>
Source record: 27652

A few days ago I read a posting from someone who had modified a scanner, a PRO-2006 I believe, for satellite reception, with the offer to post or send the details. I'm interested in hearing what can be done with this mod, especially if packet can be recieved. I have a Paccomm PSK-1 Satellite Modem being driven by an older MFJ -1270 TNC. If this can be wired into the scanner and work, I'd certainly like to give it a try. On a slightly different note, I'd be interested in finding mods to the Uniden 2600 for expanded coverage (26-30MHz) or info on modifying a old TS-670 with the general coverage option to do the same. Anyone had any luck with either of these? If so, I'd be interested in if either can be used to drive a transverter and how it has been done. Please respond to WA4YMZ@AOL.COM or, preferrably, Gary Rogers@DGC.ceo.dg.com. Tnx in advance. Gary WA4YMZ
P.S. ftp info on either of these would be great!

849. looking for 2m all mode for sat work

Newsgroup: rec.radio.amateur.space
Date: 1994-06-11 04:38:00 UTC
From: tim.marek@megasystem.com
Message-ID: <215.122.1443.0NA702A0@megasystem.com>
Source record: 27653

Hi George I have a IC290A 10W 2M allmode available.
Works well, Used to place #9 USA ROVER in Jan 94 VHF Contest.
Asking $250.00 Let me know... Tim, NC7K...sk

850. 2M EME Anyone?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-11 04:44:00 UTC
From: tim.marek@megasystem.com
Message-ID: <215.123.1443.0NA702A1@megasystem.com>
Source record: 27654

Recently I have become active on 144Mhz EME. One of the bottlenecks surounding EME is the passing of skeds made on 14.345 Weekend Mornings from the US to EU and other continents. I wonder if anyone wants to try and improve the situation using the Internet? I will respond to all msgs. Thanks de Tim, NC7K in DM09ep, Reno, NV... sk

851. Re: Jupiter Decametric Emissions

Newsgroup: rec.radio.amateur.space
Date: 1994-06-11 18:04:28 UTC
From: thomsona@netcom.com
Message-ID: <thomsonaCr8vJG.C24@netcom.com>
Source record: 27655

In article <9406101307.AA21477@fusrs3b.culham.aea.orgn.uk> neill.p.taylor@aea.ORGn.UK (Neill Taylor) writes:
>Al <toro@den.mmc.com> wrote:
>
>>I will be monitoring the decametric frequencies during the upcoming
>>Jupiter/SL9 encounter. I am looking for some more detail on the theory
>>behind the emission sources.
>[.....]
>
>Check out the article on this subject by Geoff Grayer G3NAQ in the June 1994
>issue of "Radio Communication", the journal of the Radio Society of Great
>Britain. Geoff is also asking for logs and recordings of the activity for
>the RSGB Propogation Studies Committee.
>You might also look at the newsgroup sci.astro.
>

Also this month's Monitoring Times.

852. Re: 2M EME Anyone?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-11 20:29:42 UTC
From: mack@ncifcrf.gov
Message-ID: <Cr929I.Ls@ncifcrf.gov>
Source record: 27656

In article <215.123.1443.0NA702A1@megasystem.com> tim.marek@megasystem.com (Tim Marek) writes:
>Recently I have become active on 144Mhz EME. One of the bottlenecks
>surounding EME is the passing of skeds made on 14.345 Weekend Mornings
>from the US to EU and other continents. I wonder if anyone wants to try
>and improve the situation using the Internet? I will respond to all
>msgs. Thanks de Tim, NC7K in DM09ep, Reno, NV... sk

You might also post this on the vhf listserver. Send e-mail
to vhf@w6yx.stanford.edu with the one line
subscribe vhf
to become a subscriber.
I get 3-6 mails a day from it containing such things as vhf
dxpeditions , scores in contests, who is on and where, what DX popped
up last night etc.
I haven't seen anyone arrange EME skeds there although they are
arranging every other sort of sked there.

Joe Mack NA3T
mack@ncifcrf.gov

853. ANS-162 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 01:20:28 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-162.01.1994@ampr.org>
Source record: 27657
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-162.01
DOVE VOICE TESTING STATUS

HR AMSAT NEWS SERVICE BULLETIN 162.01 FROM AMSAT HQ
SILVER SPRING, MD JUNE 11, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-162.01

DOVE-OSCAR-17 (DOVE) Voice Synthesizer Testing Continues

At about 11-JUNE-94 05:30 UTC the DOVE Ground Command Team completed a reload of the DOVE software and activated another voice test. The pronunciation of the word "Hi" is a bit different and the overall amplitude of the voice is higher. The text message is a greeting to those attending the ARRL Convention and Education Forum.

The DOVE Ground Command Team expects to continue the hardware testing process while simultaneously proceeding with software development. It is expected that this effort will probably last several days to a few weeks before all the testing and software developement is completed. There may be times when the voice message will not be heard due to uploading of new software.

It would be appreciate if reports on how well the voice can be heard with simple receiving equipment (a H/T with a rubber duck antenna) could be sent to any of the following individuals who have mail address on INTERNET:

WJ9F@amsat.org
PY2BJO@amsat.org
WD0E@amsat.org
VK7ZBX@amsat.org
N5AHD@amsat.org

Telemetry is not needed at this time.

[The AMSAT News Service would like to thank Jim White (WD0E) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-162.02
IO-26 STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 162.02 FROM AMSAT HQ
SILVER SPRING, MD JUNE 11, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-162.02

ITAMSAT-OSCAR-26 (IO-26) Status Report

After a couple of weeks of being in the stand-by mode, IO-26, under ground command, was switched back ON. A new MBL code was successfully loaded to test the modified s/c configuration (secondary TX on). Telemetry shows all the vital parameters in nominal status. Further tests will be carried out in the next days. Also due to the very limited time budget of the command stations please expect a few weeks before normal operations.

[The AMSAT News Service (ANS) would like to thank Alberto Zagni (I2KBD) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-162.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 162.03 FROM AMSAT HQ
SILVER SPRING, MD JUNE 11, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-162.03

Weekly OSCAR Status Reports: 11-JUN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

LO-19: LO-19 is on the air but only telemetry is being sent and there are are no BBS functions operational. [WH6I]

KO-23: This bird and KO-25 are very busy at the present time with message and file traffic. There have been a lot of new earth imaging files available for down loading on both birds. The file KAIW008D gives a good image of the Italian penninsula in the Med. There is also a steady stream of WISP files as ZL2TPO keeps the his programing modifications coming. Also, the program WISP can also be found on the BBS. [WH6I]

AO-16: AO-16 is running strong, the only 1200 baud bird in operation at the present time. [WH6I]

IO-26: IO-26 is sending telemtry, but the BBS is not yet on. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO

area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

854. What is Phase 3D

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 03:12:51 UTC
From: XTL00014@DUVM.OCS.DREXEL.EDU
Message-ID: <CrBFLF.HH1@Dunx1.OCS.Drexel.Edu>
Source record: 27659

What is Phase 3D?

xtl00014@duvm.ocs.drexel.edu
73 de N3RCS (Adam) es gd DX _AR_

855. Re: 2M EME Anyone?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 08:23:10 UTC
From: root@chamber.in-berlin.de
Message-ID: <1UNPBI1K@chamber.in-berlin.de>
Source record: 27660

tim.marek@megasystem.com (Tim Marek) writes:

>Recently I have become active on 144Mhz EME. One of the bottlenecks
>surounding EME is the passing of skeds made on 14.345 Weekend Mornings
>from the US to EU and other continents. I wonder if anyone wants to try
>and improve the situation using the Internet? I will respond to all
>msgs. Thanks de Tim, NC7K in DM09ep, Reno, NV... sk

InterNet is still in use for skeds. Klaus, DL4EBY is making skeds
for europe on 14.345 (via our clubstation DK0TU). We are reachable
via Internet as 'afutub.extern.tu-berlin.de' [130.149.130.138].
You may write a message via e-mail to 'klaus@afutub.extern.tu-berlin.de'
for further information about EME skeds and the EME-net.

Regards/73, Pat, DL7AUC, for DK0TU, root@afutub.extern.tu-berlin.de

--
If your server is not responding perhaps YOU should.
PGP-Public-Key available upon request or on various pgp-keyservers !

- Patrick Wendt | root@chamber.in-berlin.de | Zombies Burial Chamber -
- Ham: DL7AUC | root@afutub.extern.tu-berlin.de | Public UNIX System -
- Berlin/JO62QO | pwendt@mail.cs.tu-berlin.de | Call: +49 30 / 4025692 -
- *West*Germany | Ham-Radio: DL7AUC@DB0BLO.DEU.EU | HST D.S. 14400bps V32b -
----

856. AZ/EL Rotator FOR SALE

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 12:10:34 UTC
From: debaker@bnr.ca
Message-ID: <2thibq$ngk@crchh7b0.bnr.ca>
Source record: 27658
Cross-posted to: rec.radio.amateur.swap,rec.radio.amateur.space,rec.radio.amateur.antenna

Hello,

I have a like new Az/El rotator for sale. It is designed for light duty vhf/uhf antennas, such as an Oscar setup. Comes ready to mount on a 1.5 inch (max) vertical mast and will accept up to a 1.5 inch horizontal mast such as the fiberglass unit from KLM. Comes with a control head for each rotor, and can be easily connected to a computer for automatic control (with minor modifications).

These units are capable of carrying a fair load. I have had no problems turning a pair of KLM's (2M-14C/435-18C), even without balancing them. Rotation time is about 60 seconds AZ, 30 seconds EL (180 degrees). These units have never been outdoors either...only used inside.

I am offering two 75 foot lengths of new 5 conductor wire FREE with the package. Also, the unit can be controlled using a single 8 conductor rotor wire if desired.

I am asking $175 + shipping.

Please email to debaker@bnr.ca
or call, 214-684-7351 (day)
73,

+---+
| David E. Baker Internet: debaker@bnr.ca (Richardson, TX, USA) |
| Callsign: AB5PI Amateur Packet: AB5PI@N5AUX.#DFW.TX.USA.NA |
| My opinions do not necessarily reflect the opinions of my employer |
+---+

857. Satellite Tracking Hardware

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 15:17:08 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940613151708@kendurham.sc.ti.com>
Source record: 27564

Dialing WWV to calibrate the PC system clock has shown that the error is too large to be able to track the low earth orbiting satellites without calibrating several times a week. This could get expensive since the call is long distance.

Does anyone know of a plug-in board intended to take over the clock's time function with greater accuracy?

The computer clock problem seems to be a common one (from comments heard on AO-13.) Any info on the subject would help.

Ken Durham K5MBV

858. * SpaceNews 13-Jun-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 18:20:00 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0613.1994@ampr.org>
Source record: 27562
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0613
* SpaceNews 13-Jun-94 *

BID: $SPC0613

=========
SpaceNews
=========

MONDAY JUNE 13, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* DOVE STATUS *
===============
Jim White, WD0E, reports that DOVE's voice synthesizer is undergoing tests. The satellite is now speaking the phrase "HI, this is DOVE in space" for one minute of every four minutes. "HI" has been traditionally sent from Amateur satellites since OSCAR 1, so it seemed appropriate for this re-activation of the voice synthesizer in DO-17. The team will continue to work on improvements, including possibly raising the amplitude of the voice, which is presently about half that of the telemetry.

Software was completely reloaded last week. The S-band beacon has been turned off. Transmitter power will be optimized while maintaining a positive power budget. Reception reports are welcome (to PY2BJO). Telemetry is not needed.

Jim White
WD0E for the team: WJ9F, VK7ZBX, N5AHD, NK6K
With support from WB6LLO and K0RZ

* LUSAT STATUS *
================
LUSAT-OSCAR-19 is still not available for general use, and the BBS is not expected to be operational for the next few weeks. Raw telemetry should be sent by packet radio to LU8DYF@LU8DYF.BA.ARG.SOAM or LU8DYF@ANY-ACTIVE-SATELLITE, or via the Internet to: lu8dyf@asarin.org.ar. Certificates are available for those who forward telemetry reports.

The LUSAT-1 recovery team wants to thank all stations who sent LUSAT-1 telemetry data in RAW format, including:

JN2LHU, OZ6BL, OZ7SAT, EA1BCU, EA2CLS, WH6I, W9ODI, SM5BVF, ZS6BMN, JJ1WTK, LU1FYZ, LU2FCY, LU2JCI, LU1JBR, LU8ENU, LU6DYD and LU1DBC.

[Info via Eduardo Sweet, LU7AKC (LUSAT-1 recovery team)]

* ITAMSAT (IO-26) BACK ON *
==========
After a couple of weeks of stand-by mode, ITAMSAT under ground command was switched back ON. A new MBL code was successfully loaded to test the modified s/c configuration (secondary TX on). Telemetry shows all the vital parameters in nominal status. Further tests will be carried out in the next few days. Also due to the very limited time budget of the command stations, please expect a few weeks before normal operations.

[Info via Alberto, I2KBD, of the ITAMSAT Command Team]

* APT STATUS *
==========
Observed at 50.7 NLat, 7.1 ELon (Germany) on 28-May-94:

NOAA-9: APT 137.62 MHz On
NOAA-10: APT 137.50 MHz *OFF*
NOAA-11: APT 137.62 MHz On
NOAA-12: APT 137.50 MHz On
Meteor 2-21: APT 137.85 MHz On
Meteor 3-5: APT 137.85 MHz *OFF*

The VHF-conflict between NOAA-10 and NOAA-12 continues with NOAA-10's APT turned off. Meteor 3-5 APT is off too. The APT-frequency of Meteor 2-21 changed from 137.40 MHz to 137.85 MHz, but the signal is weak as always. As Meteor 3-5 is off, old NOAA-9 now is the best source for good vis-images.

[Info via Peter Henne]

* FO-20 NEWS *
==========
On 19-May-94, the FO-20 command station announced that a problem exists in FO-20's onboard computer system. The satellite's transponder will remain in the analog mode (JA) until further notice.

[Info via Kazu Sakamoto, JJ1WTK]

* DISTRIBUTION INFORMATION *
==========
Recent FCC rule changes have made both the originator of packet radio bulletins as well as the control operator of the originating BBS legally responsible for the content of packet radio bulletins. As a result, many bulletins entering the Amateur Packet Radio Network (AMPR) must be held for review by the BBS sysop before forwarding can begin. The adoption of this new procedure will lead to delays in the distribution of SpaceNews and other bulletins within the Amateur Packet Radio Network.

In addition, recent routing changes have lead to local Internet mail problems. This is expected to produce distribution delays within the packet network since the Internet is used as a SpaceNews distribution backbone.

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

KB3AMR KB3MF VK4ZDR

...and Flavio Cimardi at IBM Microelectronics in Italy.

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@amsat.org -or- magliaco@pilot.njin.net

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

859. Re: 2M EME Anyone? (IMPORTANT)

Newsgroup: rec.radio.amateur.space
Date: 1994-06-13 20:42:56 UTC
From: paulf@abercrombie.Stanford.EDU
Message-ID: <paulf.771540176@abercrombie.Stanford.EDU>
Source record: 27561

mack@ncifcrf.gov (Joe Mack) writes:

> You might also post this on the vhf listserver. Send e-mail
>to vhf@w6yx.stanford.edu with the one line
> subscribe vhf
> to become a subscriber.

No. DO NOT SEND SUBSCRIPTION REQUESTS TO VHF@W6YX.STANFORD.EDU! That's the mailing list address, not the subscription request address (which by convention is vhf-request@w6yx.stanford.edu). We've just gotten dozens of misdirected requests as a result of this posting...

--
-=Paul Flaherty, N9FZX | "We are meant to be masters of destiny,
->paulf@Stanford.EDU | not victims of fate." -- Ronald W. Reagan

860. space shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-06-14 00:02:00 UTC
From: jeff.podeszwa@softnet.com
Message-ID: <5.512.889.0N5CE0D4@softnet.com>
Source record: 27566

I ask this question with maturity....Is there a E-mail address on the space shuttle?

* 1st 1.11 * Romulan warbird decloaking sir... ..[.... NO CARRIER

861. New Satellite Antenna

Newsgroup: rec.radio.amateur.space
Date: 1994-06-14 01:38:19 UTC
From: gvodvarka@pomona.claremont.edu
Message-ID: <0097FE73.D913E262@pomona.claremont.edu>
Source record: 27563

Rodger, just checking to see if your new antenna is working ok. Have heard you on 447.625 talking about it. Let me know if you got my message. By the way Rich Shyer says Hello. See you later. Gary KB6ADM

862. Re: Satellite Tracking Hardware

Newsgroup: rec.radio.amateur.space
Date: 1994-06-14 10:51:00 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.125.771591059@UPEI.CA>
Source record: 27565

In article <940613151708@kendurham.sc.ti.com> ken@fstop.csc.ti.com (Ken Durham) writes:
>From: ken@fstop.csc.ti.com (Ken Durham)
>Subject: Satellite Tracking Hardware
>Keywords: satellite
>Date: Mon, 13 Jun 1994 15:17:08 GMT
>Dialing WWV to calibrate the PC system clock has shown that the error is too
>large to be able to track the low earth orbiting satellites without calibrating
>several times a week. This could get expensive since the call is long distance.
>
>Does anyone know of a plug-in board intended to take over the clock's time
>function with greater accuracy?
>
>The computer clock problem seems to be a common one (from comments heard on
>AO-13.) Any info on the subject would help.
>
>Ken Durham K5MBV
>

Sorry to post here but mail to your address bounced.

Try a shareware package - Rightime and Settime. This package does two
things very well in my initial try-out:

1. Settime: sets computer clock automatically via connection to US
Naval Observatory.

2. Rightime: Keeps computer clock (DOS AND CMOS) to within 0.1 seconds
over time after system is set (takes 3 - 6 time sets or
calls - I used WWV twice over 24 hours and then Settime
twice. Over 2 weeks the program did an excellant job.

One caveat - rightime uses the serial interrupts in doing its job so get
the most recent version as there are switches in the program to sense when
serial ports are used and it stops using the interrupts. Over the time I
tried it - the program worked very well and I have had only a few overruns
in DOS at 19.200 operating KO-23 or KO-25. Will try WISP later and
I suspect the buffers and 16550s will eliminate overruns.

THe two programs are avilable at Air Systems Technologies BBS:

(214) 869-2780

they are listed as:

Tset.... .zip
ritm.... .zip

```
.... : equate to the version number

73 for now - DAve Seeler, VY2DCS
Internet: Seeler@upei.ca
```

863. REJECTED: Ham-Space Digest V94 #153

Newsgroup: rec.radio.amateur.space
Date: 1994-06-14 14:22:24 UTC
From: op@dg-rtp.dg.com
Message-ID: <9406141522.AC00036@rtp41.rtp.dg.com>
Source record: 27567

```
----- Mail rejected by CEO. -----
(CEO_POA) Unknown addressee. Mail not sent to:peterson@dgc.ceo

----- Unsent message follows -----
From: ham-space@UCSD.EDU
To: Ham-Space@UCSD.EDU
Subject: Ham-Space Digest V94 #153
X-Ceo_Options: Document

CEO comments:
See document for message.

CEO document contents:

Ham-Space Digest Sat, 11 Jun 94 Volume 94 : Issue 153

Today's Topics:
2M EME Anyone?
Jupiter Decametric Emissions
looking for 2m all mode for sat work
Online Space Station Petition
ORBS$161.2L.AMSAT
ORBS$161.MICRO.AMSAT
ORBS$161.MISC.AMSAT
ORBS$161.OSCAR.AMSAT
ORBS$161.WEATH.AMSAT
Sat reception

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.
------------------------------------------------------------------------

Date: Fri, 10 Jun 94 20:44:00 -0800
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!iat.holonet.net!megasys!tim.marek@network.ucsd.edu
Subject: 2M EME Anyone?
To: ham-space@ucsd.edu
```

Recently I have become active on 144Mhz EME. One of the bottlenecks
surounding EME is the passing of skeds made on 14.345 Weekend Mornings
from the US to EU and other continents. I wonder if anyone wants to try
and improve the situation using the Internet? I will respond to all
msgs. Thanks de Tim, NC7K in DM09ep, Reno, NV... sk

Date: 11 Jun 94 18:04:28 GMT
From: agate!dog.ee.lbl.gov!ihnp4.ucsd.edu!library.ucla.edu!csulb.edu!csus.edu!netcom.com!t
homsona@ucbvax.berkeley.edu
Subject: Jupiter Decametric Emissions
To: ham-space@ucsd.edu

In article <9406101307.AA21477@fusrs3b.culham.aea.orgn.uk> neill.p.taylor@aea.ORGn.UK
(Neill Taylor) writes:
>Al <toro@den.mmc.com> wrote:
>
>>I will be monitoring the decametric frequencies during the upcoming
>>Jupiter/SL9 encounter. I am looking for some more detail on the theory
>>behind the emission sources.
>[.....]
>
>Check out the article on this subject by Geoff Grayer G3NAQ in the June 1994
>issue of "Radio Communication", the journal of the Radio Society of Great
>Britain. Geoff is also asking for logs and recordings of the activity for
>the RSGB Propogation Studies Committee.
>You might also look at the newsgroup sci.astro.
>

Also this month's Monitoring Times.

Date: Fri, 10 Jun 94 20:38:00 -0800
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!iat.holonet.net!megasys!tim.marek@network.ucsd.edu
Subject: looking for 2m all mode for sat work
To: ham-space@ucsd.edu

Hi George I have a IC290A 10W 2M allmode available.
Works well, Used to place #9 USA ROVER in Jan 94 VHF Contest.
Asking $250.00 Let me know... Tim, NC7K...sk

Date: 10 Jun 1994 23:31:17 GMT
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!spool.mu.edu!umn.edu!news
.cs.indiana.edu!news.Arizona.EDU!bozo!ssa@network.ucsd.edu
Subject: Online Space Station Petition
To: ham-space@ucsd.edu

Dear Colleague:

Student Space Action would like to inform you of a way in which you can directly voice your support for manned space exploration. As you read this, your space program is in danger of becoming extinct. Congress is once again attempting to eliminate space station funding. Cancellation of the space station could mean the phase-out of space exploration and eventual termination of aerospace industries and job opportunities. The resulting impact on the nation's economy, technology and educational system would be disastrous.

You can tell your congressmen exactly how much you support the space station and the manned space initiative by signing the Student Space Action's Interactive Online Petition. Simply follow these steps:

telnet seds.lpl.arizona.edu
login> space

Now answer the questions to the best of your ability
(read the directions accompanying the petition--
use <tab> to enter answer; <enter> to toggle yes/no;
up/down arrows to go backwards and forwards through
questions. Caution: if floating characters appear on
your screen--ignore--it's probably just an emulation
problem. Your petition will still be signed.

After you submit the petition, you will receive information
on your congressmen and senators so you can contact them further
by phone or mail if you desire.

The petition is also accessible by NCSA Mosaic. Simply go to the following URL and follow the directions:

URL: http://seds.lpl.arizona.edu/ssa/petition.html

Answer the questions and submit the petition and you
will receive the same information as the telnet version.
You will also have the option of linking to the space
station home page where you can read up-to-date information
on the space station, including issues of "Space Station
This Week."

Please forward this message to anyone you may feel would want to be a part of this effort--everyone!

If you believe the space program is a vital part of our country's future, both in economic growth and technological advancement, then sign the Student Space Action's Interactive Petition.

If you believe that NASA should remain as an engine for continued manned space exploration, then tell everyone you know to sign this petition.

If you believe that our government, by supporting an initiative like the space station, is making an investment in the future generation of this great nation, then send your message to Washington by signing the Student Space Action Interactive Petition.

SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

Student Space Action
ssa@seds.lpl.arizona.edu

Date: Thu, 9 Jun 1994 22:45:00 MDT
From: olivea!charnel.ecst.csuchico.edu!yeshua.marcam.com!zip.eecs.umich.edu!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@ames.arpa
Subject: ORBS$161.2L.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-161.N
2Line Orbital Elements 161.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94150.69677441 -.00000061 00000-0 10000-3 0 2876
2 14129 27.1154 325.0714 6022081 182.4311 172.2849 2.05880205 82429
UO-11
1 14781U 84021B 94159.58005905 .00000144 00000-0 32323-4 0 6999
2 14781 97.7865 174.7086 0011152 302.8221 57.1910 14.69217542549042
RS-10/11
1 18129U 87054A 94159.90407672 .00000044 00000-0 31226-4 0 9084
2 18129 82.9230 334.9649 0013215 50.4111 309.8211 13.72338053348777
AO-13
1 19216U 88051B 94157.28362721 -.00000630 00000-0 10000-4 0 9230
2 19216 57.7964 248.7429 7212622 343.0560 1.9835 2.09726498 45785
FO-20
1 20480U 90013C 94157.45457424 .00000028 00000-0 13632-3 0 6959
2 20480 99.0344 311.3041 0541277 3.8142 356.6842 12.83226187202752
AO-21
1 21087U 91006A 94157.40570894 .00000094 00000-0 82657-4 0 4773
2 21087 82.9402 150.6882 0036807 111.8581 248.6496 13.74540847168102
RS-12/13
1 21089U 91007A 94156.58678752 .00000043 00000-0 29790-4 0 6984
2 21089 82.9214 20.0542 0029669 137.8770 222.4693 13.74041810167052
ARSENE

```
1 22654U 93 31 B 94148.14207754 -.00000051 00000-0 00000 0 0 2215
2 22654 1.8240 100.0387 2920689 182.3578 176.3320 1.42202262 918
UO-14
1 20437U 90005B 94157.23861139 -.00000038 00000-0 21101-5 0 04
2 20437 98.5848 242.1624 0010423 220.2693 139.7718 14.29844994228029
AO-16
1 20439U 90005D 94156.73481228 .00000030 00000-0 28514-4 0 7997
2 20439 98.5957 242.8851 0010618 223.5361 136.4969 14.29899297227965
DO-17
1 20440U 90005E 94156.76023471 .00000036 00000-0 31082-4 0 7994
2 20440 98.5973 243.2299 0010714 222.5466 137.4883 14.30038782227982
WO-18
1 20441U 90005F 94157.22514543 -.00000081 00000-0 -14246-4 0 8011
2 20441 98.5958 243.6917 0011334 221.5982 138.4365 14.30012443228059
LO-19
1 20442U 90005G 94157.20405622 .00000024 00000-0 26325-4 0 7988
2 20442 98.5980 243.9234 0011512 222.2726 137.7572 14.30108993228061
UO-22
1 21575U 91050B 94157.69084411 .00000043 00000-0 29134-4 0 5024
2 21575 98.4354 232.4004 0007618 329.4237 30.6509 14.36917795151576
KO-23
1 22077U 92052B 94158.44314725 -.00000037 00000-0 10000-3 0 3970
2 22077 66.0817 300.3826 0014038 289.0245 70.9248 12.86286506 85531
AO-27
1 22825U 93061C 94157.72326327 .00000005 00000-0 19869-4 0 2968
2 22825 98.6523 233.6335 0007784 242.3709 117.6684 14.27625201 36194
IO-26
1 22826U 93061D 94157.21446021 .00000023 00000-0 27093-4 0 2965
2 22826 98.6522 233.1665 0008350 244.4511 115.5800 14.27729220 36125
KO-25
1 22830U 93061H 94157.71795359 .00000011 00000-0 21962-4 0 3019
2 22830 98.5510 231.0277 0011336 203.1377 156.9297 14.28055571 36202
NOAA-9
1 15427U 84123A 94159.89024788 .00000083 00000-0 68045-4 0 8336
2 15427 99.0539 210.2838 0014080 242.7480 117.2273 14.13620276489174
NOAA-10
1 16969U 86073A 94159.94159500 .00000066 00000-0 46351-4 0 7326
2 16969 98.5100 169.1973 0013720 358.6589 1.4551 14.24888833401436
MET-2/17
1 18820U 88005A 94158.84525915 .00000041 00000-0 23141-4 0 3057
2 18820 82.5399 276.0117 0015611 203.5072 156.5376 13.84716189321067
MET-3/2
1 19336U 88064A 94159.88197195 .00000051 00000-0 10000-3 0 2942
2 19336 82.5397 329.5606 0016070 286.8557 73.0807 13.16967913282164
NOAA-11
1 19531U 88089A 94159.92765754 .00000125 00000-0 92190-4 0 6535
2 19531 99.1718 148.6353 0011863 152.0390 208.1421 14.12992576294059
MET-2/18
1 19851U 89018A 94156.51345801 .00000022 00000-0 66163-5 0 2941
2 19851 82.5167 153.2269 0012537 260.2043 99.7701 13.84365397266071
```

```
MET-3/3
1 20305U 89086A 94159.25725234 .00000044 00000-0 10000-3 0 688
2 20305 82.5552 276.1489 0005929 323.3208 36.7508 13.04422019221732
MET-2/19
1 20670U 90057A 94157.67818155 .00000038 00000-0 20767-4 0 7998
2 20670 82.5475 216.8127 0015578 170.2858 189.8605 13.84188682199164
FY-1/2
1 20788U 90081A 94159.54859903 .00000285 00000-0 21713-3 0 9884
2 20788 98.8329 179.9524 0016338 35.2398 324.9843 14.01351703192497
MET-2/20
1 20826U 90086A 94157.46205984 .00000049 00000-0 30983-4 0 8073
2 20826 82.5253 154.5153 0015154 76.7190 283.5664 13.83582339186278
MET-3/4
1 21232U 91030A 94156.99788935 .00000050 00000-0 10000-3 0 7050
2 21232 82.5415 177.5026 0011846 211.6813 148.3605 13.16462992149887
NOAA-12
1 21263U 91032A 94159.96392273 .00000157 00000-0 89986-4 0 570
2 21263 98.6185 187.9223 0011859 261.5487 98.4345 14.22414262159367
MET-3/5
1 21655U 91056A 94156.88810524 .00000051 00000-0 10000-3 0 7146
2 21655 82.5508 124.7250 0011681 224.6140 135.4044 13.16830633134975
MET-2/21
1 22782U 93055A 94157.22615171 .00000040 00000-0 22931-4 0 3072
2 22782 82.5494 215.1192 0020724 257.2687 102.6153 13.83008098 38579
POSAT
1 22829U 93061G 94157.72294064 .00000046 00000-0 36383-4 0 2891
2 22829 98.6496 233.6944 0009240 227.5945 132.4448 14.28028083 36200
MIR
1 16609U 86017A 94159.91476795 .00000586 00000-0 15049-4 0 6360
2 16609 51.6469 227.7363 0002167 29.8936 330.2213 15.56279933474759
HUBBLE
1 20580U 90037B 94158.51049335 .00000475 00000-0 32164-4 0 4947
2 20580 28.4699 298.1316 0006090 348.7925 11.2530 14.90619514 27942
GRO
1 21225U 91027B 94157.52483587 .00002122 00000-0 44012-4 0 1050
2 21225 28.4623 306.1697 0003383 95.4692 264.6295 15.40894106 55296
UARS
1 21701U 91063B 94159.22695472 -.00002951 00000-0 -23660-3 0 5383
2 21701 56.9851 194.9643 0005895 100.7728 259.3969 14.96500170149599
/EX

------------------------------

Date: Thu, 9 Jun 1994 22:34:00 MDT
From: olivea!charnel.ecst.csuchico.edu!yeshua.marcam.com!zip.eecs.umich.edu!newsxfer.itd.u
mich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@ames.arpa
Subject: ORBS$161.MICRO.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-161.D
Orbital Elements 161.MICROS
```

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94157.23861139
Element set: 0
Inclination: 98.5848 deg
RA of node: 242.1624 deg
Eccentricity: 0.0010423
Arg of perigee: 220.2693 deg
Mean anomaly: 139.7718 deg
Mean motion: 14.29844994 rev/day
Decay rate: -3.8e-07 rev/day^2
Epoch rev: 22802
Checksum: 304

Satellite: AO-16
Catalog number: 20439
Epoch time: 94156.73481228
Element set: 799
Inclination: 98.5957 deg
RA of node: 242.8851 deg
Eccentricity: 0.0010618
Arg of perigee: 223.5361 deg
Mean anomaly: 136.4969 deg
Mean motion: 14.29899297 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 22796
Checksum: 359

Satellite: DO-17
Catalog number: 20440
Epoch time: 94156.76023471
Element set: 799
Inclination: 98.5973 deg
RA of node: 243.2299 deg
Eccentricity: 0.0010714
Arg of perigee: 222.5466 deg
Mean anomaly: 137.4883 deg
Mean motion: 14.30038782 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 22798
Checksum: 328

Satellite: WO-18
Catalog number: 20441
Epoch time: 94157.22514543
Element set: 801
Inclination: 98.5958 deg

RA of node: 243.6917 deg
Eccentricity: 0.0011334
Arg of perigee: 221.5982 deg
Mean anomaly: 138.4365 deg
Mean motion: 14.30012443 rev/day
Decay rate: -8.1e-07 rev/day^2
Epoch rev: 22805
Checksum: 288

Satellite: LO-19
Catalog number: 20442
Epoch time: 94157.20405622
Element set: 798
Inclination: 98.5980 deg
RA of node: 243.9234 deg
Eccentricity: 0.0011512
Arg of perigee: 222.2726 deg
Mean anomaly: 137.7572 deg
Mean motion: 14.30108993 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 22806
Checksum: 297

Satellite: UO-22
Catalog number: 21575
Epoch time: 94157.69084411
Element set: 502
Inclination: 98.4354 deg
RA of node: 232.4004 deg
Eccentricity: 0.0007618
Arg of perigee: 329.4237 deg
Mean anomaly: 30.6509 deg
Mean motion: 14.36917795 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 15157
Checksum: 302

Satellite: KO-23
Catalog number: 22077
Epoch time: 94158.44314725
Element set: 397
Inclination: 66.0817 deg
RA of node: 300.3826 deg
Eccentricity: 0.0014038
Arg of perigee: 289.0245 deg
Mean anomaly: 70.9248 deg
Mean motion: 12.86286506 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8553
Checksum: 312

Satellite: AO-27
Catalog number: 22825
Epoch time: 94157.72326327
Element set: 296
Inclination: 98.6523 deg
RA of node: 233.6335 deg
Eccentricity: 0.0007784
Arg of perigee: 242.3709 deg
Mean anomaly: 117.6684 deg
Mean motion: 14.27625201 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 3619
Checksum: 313

Satellite: IO-26
Catalog number: 22826
Epoch time: 94157.21446021
Element set: 296
Inclination: 98.6522 deg
RA of node: 233.1665 deg
Eccentricity: 0.0008350
Arg of perigee: 244.4511 deg
Mean anomaly: 115.5800 deg
Mean motion: 14.27729220 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 3612
Checksum: 270

Satellite: KO-25
Catalog number: 22830
Epoch time: 94157.71795359
Element set: 301
Inclination: 98.5510 deg
RA of node: 231.0277 deg
Eccentricity: 0.0011336
Arg of perigee: 203.1377 deg
Mean anomaly: 156.9297 deg
Mean motion: 14.28055571 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 3620
Checksum: 286

/EX

Date: Thu, 9 Jun 1994 22:42:00 MDT
From:
ihnp4.ucsd.edu!agate!doc.ic.ac.uk!daresbury!keele!uknet!bt!pipex!howland.reston.ans.net!gatech!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!
usenet@network.ucsd.edu
Subject: ORBS$161.MISC.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-161.M
Orbital Elements 161.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94157.72294064
Element set: 289
Inclination: 98.6496 deg
RA of node: 233.6944 deg
Eccentricity: 0.0009240
Arg of perigee: 227.5945 deg
Mean anomaly: 132.4448 deg
Mean motion: 14.28028083 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 3620
Checksum: 317

Satellite: MIR
Catalog number: 16609
Epoch time: 94159.91476795
Element set: 636
Inclination: 51.6469 deg
RA of node: 227.7363 deg
Eccentricity: 0.0002167
Arg of perigee: 29.8936 deg
Mean anomaly: 330.2213 deg
Mean motion: 15.56279933 rev/day
Decay rate: 5.86e-06 rev/day^2
Epoch rev: 47475
Checksum: 346

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94158.51049335
Element set: 494
Inclination: 28.4699 deg
RA of node: 298.1316 deg
Eccentricity: 0.0006090
Arg of perigee: 348.7925 deg
Mean anomaly: 11.2530 deg
Mean motion: 14.90619514 rev/day
Decay rate: 4.75e-06 rev/day^2
Epoch rev: 2794
Checksum: 309

Satellite: GRO
Catalog number: 21225
Epoch time: 94157.52483587

Element set: 105
Inclination: 28.4623 deg
RA of node: 306.1697 deg
Eccentricity: 0.0003383
Arg of perigee: 95.4692 deg
Mean anomaly: 264.6295 deg
Mean motion: 15.40894106 rev/day
Decay rate: 2.122e-05 rev/day^2
Epoch rev: 5529
Checksum: 303

Satellite: UARS
Catalog number: 21701
Epoch time: 94159.22695472
Element set: 538
Inclination: 56.9851 deg
RA of node: 194.9643 deg
Eccentricity: 0.0005895
Arg of perigee: 100.7728 deg
Mean anomaly: 259.3969 deg
Mean motion: 14.96500170 rev/day
Decay rate: -2.951e-05 rev/day^2
Epoch rev: 14959
Checksum: 344

/EX

Date: Thu, 9 Jun 1994 22:30:00 MDT
From: olivea!charnel.ecst.csuchico.edu!yeshua.marcam.com!zip.eecs.umich.edu!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@ames.arpa
Subject: ORBS$161.OSCAR.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-161.O
Orbital Elements 161.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94150.69677441
Element set: 287
Inclination: 27.1154 deg
RA of node: 325.0714 deg
Eccentricity: 0.6022081
Arg of perigee: 182.4311 deg
Mean anomaly: 172.2849 deg

Mean motion: 2.05880205 rev/day
Decay rate: -6.1e-07 rev/day^2
Epoch rev: 8242
Checksum: 277

Satellite: UO-11
Catalog number: 14781
Epoch time: 94159.58005905
Element set: 699
Inclination: 97.7865 deg
RA of node: 174.7086 deg
Eccentricity: 0.0011152
Arg of perigee: 302.8221 deg
Mean anomaly: 57.1910 deg
Mean motion: 14.69217542 rev/day
Decay rate: 1.44e-06 rev/day^2
Epoch rev: 54904
Checksum: 315

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94159.90407672
Element set: 908
Inclination: 82.9230 deg
RA of node: 334.9649 deg
Eccentricity: 0.0013215
Arg of perigee: 50.4111 deg
Mean anomaly: 309.8211 deg
Mean motion: 13.72338053 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 34877
Checksum: 297

Satellite: AO-13
Catalog number: 19216
Epoch time: 94157.28362721
Element set: 923
Inclination: 57.7964 deg
RA of node: 248.7429 deg
Eccentricity: 0.7212622
Arg of perigee: 343.0560 deg
Mean anomaly: 1.9835 deg
Mean motion: 2.09726498 rev/day
Decay rate: -6.30e-06 rev/day^2
Epoch rev: 4578
Checksum: 328

Satellite: FO-20
Catalog number: 20480
Epoch time: 94157.45457424
Element set: 695

Inclination: 99.0344 deg
RA of node: 311.3041 deg
Eccentricity: 0.0541277
Arg of perigee: 3.8142 deg
Mean anomaly: 356.6842 deg
Mean motion: 12.83226187 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 20275
Checksum: 294

Satellite: AO-21
Catalog number: 21087
Epoch time: 94157.40570894
Element set: 477
Inclination: 82.9402 deg
RA of node: 150.6882 deg
Eccentricity: 0.0036807
Arg of perigee: 111.8581 deg
Mean anomaly: 248.6496 deg
Mean motion: 13.74540847 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16810
Checksum: 328

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94156.58678752
Element set: 698
Inclination: 82.9214 deg
RA of node: 20.0542 deg
Eccentricity: 0.0029669
Arg of perigee: 137.8770 deg
Mean anomaly: 222.4693 deg
Mean motion: 13.74041810 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 16705
Checksum: 321

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94148.14207754
Element set: 221
Inclination: 1.8240 deg
RA of node: 100.0387 deg
Eccentricity: 0.2920689
Arg of perigee: 182.3578 deg
Mean anomaly: 176.3320 deg
Mean motion: 1.42202262 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 91
Checksum: 254

/EX

Date: Thu, 9 Jun 1994 22:39:00 MDT
From: olivea!charnel.ecst.csuchico.edu!yeshua.marcam.com!zip.eecs.umich.edu!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@ames.arpa
Subject: ORBS$161.WEATH.AMSAT
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-161.W
Orbital Elements 161.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX June 10, 1994
BID: $ORBS-161.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94159.89024788
Element set: 833
Inclination: 99.0539 deg
RA of node: 210.2838 deg
Eccentricity: 0.0014080
Arg of perigee: 242.7480 deg
Mean anomaly: 117.2273 deg
Mean motion: 14.13620276 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 48917
Checksum: 321

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94159.94159500
Element set: 732
Inclination: 98.5100 deg
RA of node: 169.1973 deg
Eccentricity: 0.0013720
Arg of perigee: 358.6589 deg
Mean anomaly: 1.4551 deg
Mean motion: 14.24888833 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 40143
Checksum: 321

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94158.84525915
Element set: 305
Inclination: 82.5399 deg
RA of node: 276.0117 deg
Eccentricity: 0.0015611

Arg of perigee: 203.5072 deg
Mean anomaly: 156.5376 deg
Mean motion: 13.84716189 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 32106
Checksum: 305

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94159.88197195
Element set: 294
Inclination: 82.5397 deg
RA of node: 329.5606 deg
Eccentricity: 0.0016070
Arg of perigee: 286.8557 deg
Mean anomaly: 73.0807 deg
Mean motion: 13.16967913 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28216
Checksum: 345

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94159.92765754
Element set: 653
Inclination: 99.1718 deg
RA of node: 148.6353 deg
Eccentricity: 0.0011863
Arg of perigee: 152.0390 deg
Mean anomaly: 208.1421 deg
Mean motion: 14.12992576 rev/day
Decay rate: 1.25e-06 rev/day^2
Epoch rev: 29405
Checksum: 314

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94156.51345801
Element set: 294
Inclination: 82.5167 deg
RA of node: 153.2269 deg
Eccentricity: 0.0012537
Arg of perigee: 260.2043 deg
Mean anomaly: 99.7701 deg
Mean motion: 13.84365397 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 26607
Checksum: 312

Satellite: MET-3/3
Catalog number: 20305

Epoch time: 94159.25725234
Element set: 68
Inclination: 82.5552 deg
RA of node: 276.1489 deg
Eccentricity: 0.0005929
Arg of perigee: 323.3208 deg
Mean anomaly: 36.7508 deg
Mean motion: 13.04422019 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22173
Checksum: 287

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94157.67818155
Element set: 799
Inclination: 82.5475 deg
RA of node: 216.8127 deg
Eccentricity: 0.0015578
Arg of perigee: 170.2858 deg
Mean anomaly: 189.8605 deg
Mean motion: 13.84188682 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 19916
Checksum: 368

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94159.54859903
Element set: 988
Inclination: 98.8329 deg
RA of node: 179.9524 deg
Eccentricity: 0.0016338
Arg of perigee: 35.2398 deg
Mean anomaly: 324.9843 deg
Mean motion: 14.01351703 rev/day
Decay rate: 2.85e-06 rev/day^2
Epoch rev: 19249
Checksum: 359

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94157.46205984
Element set: 807
Inclination: 82.5253 deg
RA of node: 154.5153 deg
Eccentricity: 0.0015154
Arg of perigee: 76.7190 deg
Mean anomaly: 283.5664 deg
Mean motion: 13.83582339 rev/day
Decay rate: 4.9e-07 rev/day^2

Epoch rev: 18627
Checksum: 323

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94156.99788935
Element set: 705
Inclination: 82.5415 deg
RA of node: 177.5026 deg
Eccentricity: 0.0011846
Arg of perigee: 211.6813 deg
Mean anomaly: 148.3605 deg
Mean motion: 13.16462992 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 14988
Checksum: 323

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94159.96392273
Element set: 57
Inclination: 98.6185 deg
RA of node: 187.9223 deg
Eccentricity: 0.0011859
Arg of perigee: 261.5487 deg
Mean anomaly: 98.4345 deg
Mean motion: 14.22414262 rev/day
Decay rate: 1.57e-06 rev/day^2
Epoch rev: 15936
Checksum: 332

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94156.88810524
Element set: 714
Inclination: 82.5508 deg
RA of node: 124.7250 deg
Eccentricity: 0.0011681
Arg of perigee: 224.6140 deg
Mean anomaly: 135.4044 deg
Mean motion: 13.16830633 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13497
Checksum: 281

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94157.22615171
Element set: 307
Inclination: 82.5494 deg
RA of node: 215.1192 deg

Eccentricity: 0.0020724
Arg of perigee: 257.2687 deg
Mean anomaly: 102.6153 deg
Mean motion: 13.83008098 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 3857
Checksum: 288

/EX

Date: 10 Jun 1994 20:46:05 -0400
From: newstf01.cr1.aol.com!search01.news.aol.com!not-for-mail@uunet.uu.net
Subject: Sat reception
To: ham-space@ucsd.edu

A few days ago I read a posting from someone who had modified a
scanner, a PRO-2006 I believe, for satellite reception, with the
offer to post or send the details. I'm interested in hearing what
can be done with this mod, especially if packet can be recieved. I
have a Paccomm PSK-1 Satellite Modem being driven by an older MFJ
-1270 TNC. If this can be wired into the scanner and work, I'd
certainly like to give it a try. On a slightly different note,
I'd be interested in finding mods to the Uniden 2600 for expanded
coverage (26-30MHz) or info on modifying a old TS-670 with the
general coverage option to do the same. Anyone had any luck with
either of these? If so, I'd be interested in if either can be used
to drive a transverter and how it has been done. Please respond to
WA4YMZ@AOL.COM or, preferrably, Gary Rogers@DGC.ceo.dg.com. Tnx in
advance. Gary WA4YMZ
P.S. ftp info on either of these would be great!

End of Ham-Space Digest V94 #153
****

864. PRO-2006 as satellite receiver

Newsgroup: rec.radio.amateur.space
Date: 1994-06-14 15:11:57 UTC
From: bmm1@freenet3.scri.fsu.edu
Message-ID: <2tkhbt$l8a@freenet3.scri.fsu.edu>
Source record: 27568

A few years ago I bought a PRO-2006 scanner with the hopes that I could use it to receive the OSCAR satellites. As it turns out this versatile programmable scanner can be used in the down link for all the digital satellites to date. Here are the modifications and operating procedures that I have used with the PRO-2006 scanner for use as the down link receiver for the digital OSCAR satellites.

First of all, in response to several questions, the PRO-2006 will receive 1200 baud AFSK (typical terrestrial packet and DOVE DO-17 (145.825MHz) telemetry) without modification. Simply connect the external speaker jack to a TNC. Any TNC that will work with terrestrial packet BBSs will demodulate DO-17 telemetry. A 2 Meter antenna typical of that used for FM voice or packet will suffice. (DO-17 also transmitted synthesized voice shortly after launch in 1990 and I understand will be doing so again soon, after a long silence). I use a couple of adapters that came from Radio Shack to adapt my type N and PL259 coax connectors to the PRO-2006's BNC antenna jack. I don't think that the little telescoping antenna will pick up DO-17 well enough to demodulate much telemetry.

My next attempt at satellite reception was PACKSAT AO-16. This satellite transmits 1200 baud PSK modulation. In addition to the PRO-2006 I use my HF rig, a Kenwood TS-430S, and an L.L.GRACE DSP-12 TNC. Since the PRO-2006 doesn't demodulate single sideband I use it as a very wide band down converter feeding signals to my HF rig. This is a very simple modification. I tapped off the cathode of D33 with a 10pf capacitor and a few inches of RG 174 coax to a phono/video type connector that I added to the back panel. D33 is inside the top cover about 3 inches back from the front panel and 2 inches over from the left side of the linear PC board. The glass cased diode is end mounted and the cathode is the end pointing up.

This gives you access to the 455KHz final IF signal just prior to the PRO-2006's demodulator circuitry. The signal has a bandwidth of about 8 to 10 KHz. My HF rig has a transverter input on the back that I connect this signal to. You could also connect it directly to the HF rig's antenna jack but if you were to accidentally key the HF transmitter the PRO-2006 would be toast! Next tune your HF rig to 455KHz upper sideband and, using AO-16 as an example, the PRO-2006

to 437.050 MHz. Because the signal bandwidth is at least 8 KHz wide you can tune your HF rig to cover much of the Doppler shift during a pass. When your HF rig's dial reads 451 KHz you will be receiving 437.046 MHz. The DSP-12 (and other PSK TNCs) uses a phase locked loop to track Doppler shift by generating "mike click" signals. These you send to your HF rig. This setup will work with AO-16, WO-18, LO-19, FO-20 and IO-26 (although I haven't tried IO-26).

440 MHz signals are subject to much more attenuation in the coax than 144 MHz signals. I needed 50 feet of coax to get above the trees and even with very high quality coax (4XL) I needed a mast mounted preamp. The preamp made a huge difference.

The above modification also lets you use your HF rigs entire front end, including the signal strength meter, at any frequency that the PRO-2006 will receive. Try listening to some of the odd signals across the bands in SSB or with your HF rigs FM section. Very interesting.

Next I was ready to tackle the 9600 baud FSK satellites. This requires an additional modification, as simple as, and much like the one described above. 9600 baud FSK data contains wave form components that are too high in frequency to make it through the audio amplifier section of most, if not all, radio receivers. This, by the way, leads to the rather confusing fact that if you tune in to a 9600 baud FSK signal you will not hear anything that sounds like 1200 baud AFSK or PSK. What will happen is that the signal will solidly break the squelch but it will sound very much like background noise. "T" the output from this modification out to an oscilloscope however and you can readily see the difference. With experience you can hear the difference as well.

Make this modification exactly like the last one but leave out the capacitor. Solder the center conductor of the coax to TP2. That's it. TP2 is located about one quarter of an inch toward the left front corner of the PC board from diode D33 where the previous coax was terminated. It looks like an end mounted resistor with no bands on it and the top lead cut off short. Run this signal to the 9600 baud FSK input of your TNC, tune to a 9600 baud satellite and if everything worked at 1200 baud you should have no problem at 9600.

There is a serendipitous feature of the PRO-2006 that provides automatic Doppler compensation with 9600 baud FSK. I will use UO-22 which transmits on 435.120 MHz as an example. The PRO-2006 has 10 programmable "limit search" memories (enough for 10 satellites). Program the upper limit of search to 435.130 MHz and lower limit to 435.110

MHz. Then press the down arrow so that the search progresses from higher to lower frequencies, the direction of Doppler shift. Set the squelch at about one and a half and the radio will lock onto the signal when the satellite comes into range, then follow the Doppler shift until it goes out of range. When the signal fades deep enough to return to search mode the search wraps around and locks on again within fractions of a second after the signal returns. Use the delay option to minimize return to search mode. With the frequencies for each satellite programmed into a different limit search memory you can change satellites with the press of a single button.

Considering the price of radio equipment I think the PRO-2006 with these modifications gives you very good "bang for the buck". Many people already own an HF rig and a 2 meter rig by the time they decide to get into the satellites. All mode 440 MHz rigs are quite pricy and AO-21 is the only low earth orbit satellite with a 440 MHz uplink.

Anyway I hope this helps. Good luck.

Bruce N4USH

--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

865. Re: Satellite Tracking Hardware

Newsgroup: rec.radio.amateur.space
Date: 1994-06-14 18:13:27 UTC
From: RLOKER01@HARRIS.COM
Message-ID: <19940614141312.RLOKER01@p15jg.ess.harris.com>
Source record: 27569

In Article <940613151708@kendurham.sc.ti.com> "ken@fstop.csc.ti.com (Ken Durham)" says:
> Dialing WWV to calibrate the PC system clock has shown that the error is too
> large to be able to track the low earth orbiting satellites without calibrating
> several times a week. This could get expensive since the call is long distance.
>
> Does anyone know of a plug-in board intended to take over the clock's time
> function with greater accuracy?
>
> The computer clock problem seems to be a common one (from comments heard on
> AO-13.) Any info on the subject would help.
>
> Ken Durham K5MBV
>
>
Judging from the K5MBV, I would think the obvious solution would be to use
WWV HF service on 2.5, 5.0, 10.0 or 15.0 MHZ would be an easy solution to
the cost problem.

Your manual setting of the clock ought to be within a second or so, which
seems close enough unless you have a _real_ narrow beam.

Another choice would be to use this problem as an excuse to buy yourself
a hand-help marine GPS receiver for about $500.00, about the cost of a
specialized pc-card. I think some of them will display the time that they
use for their position calculation.

R.C. LOKERSON (BOB) MAIL ADDRESS: VOICE : 407.729.2257
HARRIS MDSO/MIS/DCC/ATG HARRIS E.S.S. SMTP : RLOKER01@HARRIS.COM
BLDG 15/RM 838 P.O. BOX 37 CCMAIL: RLOKER01
PALM BAY, FLORIDA MELBOURNE FL FCC : WA3PKX
32902 HOME : 407.725.8024

(I WROTE IT, NOT MR. HARRIS)

"ANYONE WHO WEARS A TIE TO SHOW HOW SMART HE IS CANNOT BE VERY SMART"

866. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-06-15 11:01:45 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-771678100@unomaha.edu>
Source record: 27570
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

Posted-By: auto-faq 3.2.1.2
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info, and rec.radio.swap newsgroups. It is intended to serve as a guide for the new reader on what to find where. Questions and comments may be directed to the author, Jay Maynard, K5ZC, by Internet electronic mail at jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September 1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to note the rmgroup of rec.radio.amateur.packet, and to officially retire some (in)famous threads of discussion on rec.radio.amateur.policy.

History
=======

Way back when, before there was a Usenet, the Internet hosted a mailing list for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions were held on the mailing list, and sent to the mailboxes of those who had signed up for it. When the Usenet software was created, and net news as we now know it was developed, a newsgroup was created for hams: net.ham-radio. The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began to dominate other topics in the group and on the list. This resulted in the logical solution: a group was created to hold the packet discussion, and another corresponding mailing list was created as well: net.ham-radio.packet and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great Renaming essentially unchanged, moving from net.ham-radio[.packet] to rec.ham-radio[.packet]. Readership and volume grew with the rest of the network.

The INFO-HAMS mailing list was originally run from a US Army computer at White Sands Missile Range, SIMTEL20. There were few problems with this arrangement, but one was that the system was not supposed to be used for commercial purposes. Since one of hams' favorite pastimes is swapping gear, it was natural for hams to post messages about equipment for sale to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use restriction, and after some argument, a group was created specifically

for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
===========================

Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

--
Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

867. Wanted: Copy of Wintrack 2.0

Newsgroup: rec.radio.amateur.space
Date: 1994-06-15 23:11:37 UTC
From: cmoore@ilx018.intel.com
Message-ID: <2to1r9$sdc@chnews.intel.com>
Source record: 27571

How can a friend of mine obtain a copy of Wintrack 2.0? Is it shareware?

thanks and 73, KG7BK, OOTC, CecilMoore@delphi.com

868. radio comparison

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 00:47:24 UTC
From: whitestone@ins.infonet.net
Message-ID: <2to7es$qp9@insosf1.infonet.net>
Source record: 27572

If someone has some ideas on comparisons of radios I am looking at the ICOM 970 and the 736R Yaseau. Right now I am favoring the ICOM 970. I do not need the six meters as I am planning to get a seperate unit. any thoughts ... also on antennas ... am probably going to use the hygain oscar units ..

869. Re: radio comparison

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 02:32:13 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jun16.023213.23760@ke4zv.atl.ga.us>
Source record: 27573

In article <2to7es$qp9@insosf1.infonet.net> whitestone@ins.infonet.net writes:
>If someone has some ideas on comparisons of radios I am looking at the ICOM 970 and the 736R Yaseau. Right now I am favoring the ICOM 970. I do not need the six meters as I am planning to get a seperate unit. any thoughts ... also on antennas ... am probably going to use the hygain oscar units ..

I considered the 970H but wound up buying the 736. The 970H has a great set of features, it makes enough power you don't need an external amp, and the human factors boys did a good job on the controls, but the receiver isn't quite up to the standards of the 275/475 Icoms (they're the best). It folds under conditions of strong adjacent signals. Perhaps the synthesizer has too much phase noise. I checked 5 of them, and they all were the same. It'd probably be fine in a RF quiet location. It's also much more expensive than the other radios.

I bought and quickly sold a Kenwood 790A, that radio was a huge disappointment. Not only were the human factors horrible, but it had serious flaws for satellite use. The narrow filters only work in the main band unit, but you listen to the satellite on the sub-band unit, so they're a waste. It won't do sat-track tuning unless you hold the SAT button down. That's just stupid, requiring you to use both hands to tune the radio. And the thermal design of the radio is horrible. It gets very hot after only brief transmissions. The UHF amplifier brick died after a month. The receiver is pretty sensitive though, but that's not a real issue for satellite since you'll be using a mast mount preamp anyway.

So I finally settled on the 736R. You can't listen to two bands at once like the other two, some of the function controls are laid out funky, the discriminator center meter doesn't center, but it works fine for satellites, the narrow filters work, it never runs hot, and it's been rock reliable. It seems I don't have a lot of good things to say about this radio, but that's misleading. It's very competent at what it does, and what it does is what you need for satellite work. I also got a great deal on it.

My ideal station though would be the IC275H/IC475H. The twins are just wonderful radios, great receivers, rock reliable transmitters, good control layouts and functions, but I couldn't justify the cost. Each individually costs more than a street priced 736R.

On the subject of antennas I'm adamant, there's no substitute for the KLM22C and KLM40CX. They're simply better than anything else available. Use a Yaesu 5400B dual axis rotator system, fiberglass crossboom, SSB Electronics preamps, hardline, and a TAPR Trakbox,

and you have an ideal antenna system. That's *the* key to satellite operation.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

870. Railroad track as an antenna?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 06:58:33 UTC
From: s9898198@sandcastle.cosc.brocku.ca
Message-ID: <1994Jun16.065833.28482@spartan.ac.BrockU.CA>
Source record: 27575

I have heard a legend that a college radio station (either at MIT, Tufts, or Swarthmore) welded antenna to railroad tracks, and peeved the FCC by broadcasting nationwide. Is this true? If anyone knows, please email me (or post here) If you do know, could you please direct me to some documentation regarding this legend if you can.

This is very important! Thanks in advance.

James R. Storm |
Accounting Student | This message was brought to you by
s9898198@sandcastle.cosc.brocku.ca | the letters M, Q, and the number 6
(905) 227-9571 voice |
---

871. Shortwave radio guide book HELP!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 07:33:16 UTC
From: idpt783@tpts1.seed.net.tw
Message-ID: <2tov7s$bfe@aladdin.iii.org.tw>
Source record: 27574

HI!

I am considering buying a shortwave radio guide book.
Here are 3 three books to choice.
1.Passport World Band Radio 1994
2.1994 Edition Wordldradio TV Handbook
3.Shortwave Listening Guide Book, Harry Helms, Second Edition
Do you have an opinion on which one of these is better for my to buy ?

Please send mail to idpt783@tpts1.seed.net.tw preferably.

thanks a much !
-Percy WANG

872. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 15:22:00 UTC
From: MUENZLERK@uthscsa.EDU
Message-ID: <2E006F85@msmail.uthscsa.edu>
Source record: 27576

James at berkeley.edu wrote:

>I have heard a legend that a college radio station (either at MIT, Tufts,
>or Swarthmore) welded antenna to railroad tracks, and peeved the FCC by
>broadcasting nationwide. Is this true? If anyone knows, please email me
>(or post here) If you do know, could you please direct me to some
>documentation regarding this legend if you can.
>
>This is very important! Thanks in advance.

Doubtful, very doubtful. Railroad tracks are grounded at semi-regular
distances up and down the tracks. Unless the frequency exactly matched
the distance between the grounds it would have very poor performance.

Kevin

Legal stuff:
The above opinions are my own and not necessarily those of the staff,
faculty, administration, or lab animals (woof!) of The University of
Texas Health Science Center at San Antonio.

Kevin R. Muenzler, WB5RUE The University of Texas Health
muenzlerk@uthscsa.edu Science Center at San Antonio,
Department of Computing Resources
** There is no such thing as a Monkey-Proof Program! **
** I can prove it! **
---

873. ICOM 275A/475H For Sale

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 18:22:40 UTC
From: mikec@comtch.iea.com
Message-ID: <2tq59g$sh7@krel.iea.com>
Source record: 27577

Icom 275A and Icom 475H with Icom Satellite Interface, 70cm and 2m Icom preamps, Alliance AZ rotor and Yaesu 500 EL rotor.

Sell as complete set only - $1900 u ship

--
- - - - - - - - - - - - mikec@comtch.iea.com - - - - - - - - - - - - - - - -

Michael B. Candy Amateur Radio Call: KI7FX
P.O. Box 1953 KI7FX@KA7FVV.#EWA.WA.USA.NA
Airway Hts, WA. 99001-1953 American Digital Radio Society

874. Looking for short wave radio.

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 22:38:42 UTC
From: mrpaolo@owl.WPI.EDU
Message-ID: <2tqk9i$4gr@bigboote.WPI.EDU>
Source record: 27578

Hello,
I have never read this newsgroup, and only recently dug up an old Sky&Tel
in which there are plans for making a directional antenna to observe Jupiter.
The problem is that my short wave radio broke down. Does anyone have any
ideas of how to get one for one day only ? (the Shoemaker-Levy vs. Jup.)
I was thinking of buying one and then returning it. Any help and extra info
on how to observe this event (frequency ?) would be greatly appreciated.
Thanks.
--
Tom Szymkiewicz
Worcester, Massachusetts

875. Re: Shortwave radio guide book HELP!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-06-16 22:51:33 UTC
From: gap@pickburn.demon.co.uk
Message-ID: <5@pickburn.demon.co.uk>
Source record: 27601

In article <2tov7s$bfe@aladdin.iii.org.tw> idpt783@tpts1.seed.net.tw writes:
>HI!
>
>I am considering buying a shortwave radio guide book.
> Here are 3 three books to choice.
> 1.Passport World Band Radio 1994
> 2.1994 Edition Wordldradio TV Handbook
> 3.Shortwave Listening Guide Book, Harry Helms, Second Edition
>Do you have an opinion on which one of these is better for my to buy ?
>
Not clear where your are calling from, but if UK (or US/Europe) I suggest you request them all from your local library, then make an informed choice, if any still needed. We need to use our libraries before they are taken away in government cuts !! Usually libraries are only too happy to dig things out, or find them elsewhere, or even buy fresh.
>
>

876. 2 line elements not working...

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 03:34:07 UTC
From: tomsunman@aol.com
Message-ID: <2tr5jf$b1q@search01.news.aol.com>
Source record: 27579

I've been saving the 2 line element sets from this newsgroup and they are NOT working with stsorbit plus. I remove the info before the actual set and the program will not read it. I don't quite understand why. Any help would be appreciated through e-mail. In the meantime, I'll have to go elsewhere for the latest sets. Thanks!

Tom

randall@sunydutchess.edu

877. ORBS$168.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 14:15:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-168.o.1994@ampr.org>
Source record: 27581
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-168.O
Orbital Elements 168.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX June 17, 1994
BID: $ORBS-168.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94161.37059705
Element set: 288
Inclination: 27.0950 deg
RA of node: 323.3862 deg
Eccentricity: 0.6022573
Arg of perigee: 185.3079 deg
Mean anomaly: 163.3129 deg
Mean motion: 2.05878627 rev/day
Decay rate: -8.9e-07 rev/day^2
Epoch rev: 8264
Checksum: 320

Satellite: UO-11
Catalog number: 14781
Epoch time: 94164.07495908
Element set: 700
Inclination: 97.7863 deg
RA of node: 178.9927 deg
Eccentricity: 0.0010944
Arg of perigee: 287.1976 deg
Mean anomaly: 72.8030 deg
Mean motion: 14.69219433 rev/day
Decay rate: 1.65e-06 rev/day^2
Epoch rev: 54970
Checksum: 346

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94163.98699348
Element set: 909
Inclination: 82.9229 deg
RA of node: 331.9456 deg
Eccentricity: 0.0013017
Arg of perigee: 40.7525 deg
```

Mean anomaly: 319.4600 deg
Mean motion: 13.72338190 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 34933
Checksum: 322

Satellite: AO-13
Catalog number: 19216
Epoch time: 94166.34337152
Element set: 924
Inclination: 57.7884 deg
RA of node: 247.1622 deg
Eccentricity: 0.7213082
Arg of perigee: 343.7462 deg
Mean anomaly: 2.0006 deg
Mean motion: 2.09724920 rev/day
Decay rate: -4.05e-06 rev/day^2
Epoch rev: 4597
Checksum: 295

Satellite: FO-20
Catalog number: 20480
Epoch time: 94165.87456846
Element set: 697
Inclination: 99.0376 deg
RA of node: 318.1343 deg
Eccentricity: 0.0541065
Arg of perigee: 344.7655 deg
Mean anomaly: 13.7694 deg
Mean motion: 12.83225459 rev/day
Decay rate: -6.5e-07 rev/day^2
Epoch rev: 20383
Checksum: 333

Satellite: AO-21
Catalog number: 21087
Epoch time: 94166.94154505
Element set: 480
Inclination: 82.9390 deg
RA of node: 143.6297 deg
Eccentricity: 0.0036919
Arg of perigee: 86.0554 deg
Mean anomaly: 274.4806 deg
Mean motion: 13.74541473 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 16941
Checksum: 326

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94165.54353671

Element set: 700
Inclination: 82.9214 deg
RA of node: 13.4113 deg
Eccentricity: 0.0030198
Arg of perigee: 113.5767 deg
Mean anomaly: 246.8572 deg
Mean motion: 13.74042529 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 16828
Checksum: 301

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94167.12210594
Element set: 262
Inclination: 1.8681 deg
RA of node: 99.2228 deg
Eccentricity: 0.2919369
Arg of perigee: 183.9006 deg
Mean anomaly: 172.6566 deg
Mean motion: 1.42203062 rev/day
Decay rate: -1.00e-06 rev/day^2
Epoch rev: 118
Checksum: 276

/EX

878. ORBS$168.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 14:17:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-168.d.1994@ampr.org>
Source record: 27580
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-168.D
Orbital Elements 168.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX June 17, 1994
BID: $ORBS-168.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94166.19574678
Element set: 2
Inclination: 98.5879 deg
RA of node: 250.9992 deg
Eccentricity: 0.0010525
Arg of perigee: 193.3603 deg
Mean anomaly: 166.7289 deg
Mean motion: 14.29846532 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 22930
Checksum: 338

Satellite: AO-16
Catalog number: 20439
Epoch time: 94165.27176083
Element set: 801
Inclination: 98.5971 deg
RA of node: 251.3159 deg
Eccentricity: 0.0010737
Arg of perigee: 197.6942 deg
Mean anomaly: 162.3867 deg
Mean motion: 14.29899811 rev/day
Decay rate: -2.0e-08 rev/day^2
Epoch rev: 22918
Checksum: 336

Satellite: DO-17
Catalog number: 20440
Epoch time: 94165.71615950
Element set: 801
Inclination: 98.5984 deg
RA of node: 252.0768 deg
Eccentricity: 0.0010908
Arg of perigee: 195.1875 deg
```

Mean anomaly: 164.8984 deg
Mean motion: 14.30039539 rev/day
Decay rate: 1.2e-07 rev/day^2
Epoch rev: 22926
Checksum: 325

Satellite: WO-18
Catalog number: 20441
Epoch time: 94166.18122935
Element set: 803
Inclination: 98.5977 deg
RA of node: 252.5380 deg
Eccentricity: 0.0011436
Arg of perigee: 194.4906 deg
Mean anomaly: 165.5950 deg
Mean motion: 14.30014120 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 22933
Checksum: 291

Satellite: LO-19
Catalog number: 20442
Epoch time: 94165.73975260
Element set: 800
Inclination: 98.5974 deg
RA of node: 252.3577 deg
Eccentricity: 0.0011833
Arg of perigee: 195.4192 deg
Mean anomaly: 164.6628 deg
Mean motion: 14.30109943 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 22928
Checksum: 320

Satellite: UO-22
Catalog number: 21575
Epoch time: 94166.18613268
Element set: 504
Inclination: 98.4349 deg
RA of node: 240.7242 deg
Eccentricity: 0.0007185
Arg of perigee: 303.1212 deg
Mean anomaly: 56.9305 deg
Mean motion: 14.36919228 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 15279
Checksum: 306

Satellite: KO-23
Catalog number: 22077
Epoch time: 94167.69551354

Element set: 399
Inclination: 66.0793 deg
RA of node: 281.0075 deg
Eccentricity: 0.0014358
Arg of perigee: 287.6327 deg
Mean anomaly: 72.3125 deg
Mean motion: 12.86286638 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8672
Checksum: 334

Satellite: AO-27
Catalog number: 22825
Epoch time: 94166.62421734
Element set: 298
Inclination: 98.6526 deg
RA of node: 242.4464 deg
Eccentricity: 0.0007983
Arg of perigee: 211.0084 deg
Mean anomaly: 149.0633 deg
Mean motion: 14.27626226 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 3746
Checksum: 306

Satellite: IO-26
Catalog number: 22826
Epoch time: 94166.18484780
Element set: 298
Inclination: 98.6525 deg
RA of node: 242.0491 deg
Eccentricity: 0.0008198
Arg of perigee: 216.6060 deg
Mean anomaly: 143.4552 deg
Mean motion: 14.27730366 rev/day
P@Yn>WD:oZ.PD:u&D^z;*yayN=YHr%$2^R_8
MCi6&#Eex6%@ZIfRo_2D[!n?P>g<=,Ny6DKrCpX8no5">+w:Lv+Nr?W7>E)?HBKF{(A>[&_S{
A0,

879. ORBS$168.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 14:58:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-168.w.1994@ampr.org>
Source record: 27587
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-168.W
Orbital Elements 168.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX June 17, 1994
BID: $ORBS-168.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94167.74678503
Element set: 842
Inclination: 99.0533 deg
RA of node: 218.2332 deg
Eccentricity: 0.0014197
Arg of perigee: 218.9243 deg
Mean anomaly: 141.0907 deg
Mean motion: 14.13622176 rev/day
Decay rate: 8.4e-07 rev/day^2
Epoch rev: 49028
Checksum: 311

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94167.73609929
Element set: 740
Inclination: 98.5022 deg
RA of node: 176.7464 deg
Eccentricity: 0.0013788
Arg of perigee: 335.5349 deg
Mean anomaly: 24.5180 deg
Mean motion: 14.24889628 rev/day
Decay rate: -1.7e-07 rev/day^2
Epoch rev: 40254
Checksum: 342

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94168.23877222
Element set: 312
Inclination: 82.5406 deg
RA of node: 268.5405 deg
Eccentricity: 0.0016260
Arg of perigee: 175.4425 deg
```

Mean anomaly: 184.6887 deg
Mean motion: 13.84717026 rev/day
Decay rate: 8.0e-07 rev/day^2
Epoch rev: 32236
Checksum: 310

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94167.93501398
Element set: 296
Inclination: 82.5373 deg
RA of node: 323.8588 deg
Eccentricity: 0.0015676
Arg of perigee: 265.2572 deg
Mean anomaly: 94.6761 deg
Mean motion: 13.16967664 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28322
Checksum: 344

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94167.78766704
Element set: 662
Inclination: 99.1721 deg
RA of node: 156.6873 deg
Eccentricity: 0.0012261
Arg of perigee: 130.2107 deg
Mean anomaly: 230.0163 deg
Mean motion: 14.12994827 rev/day
Decay rate: 1.20e-06 rev/day^2
Epoch rev: 29516
Checksum: 296

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94165.90933321
Element set: 296
Inclination: 82.5177 deg
RA of node: 145.7365 deg
Eccentricity: 0.0012706
Arg of perigee: 230.6098 deg
Mean anomaly: 129.3939 deg
Mean motion: 13.84366225 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 26737
Checksum: 331

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94167.77116453

Element set: 71
Inclination: 82.5562 deg
RA of node: 270.2734 deg
Eccentricity: 0.0005343
Arg of perigee: 297.9843 deg
Mean anomaly: 62.0727 deg
Mean motion: 13.04424679 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22284
Checksum: 296

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94166.13556307
Element set: 801
Inclination: 82.5472 deg
RA of node: 210.0963 deg
Eccentricity: 0.0016138
Arg of perigee: 146.5713 deg
Mean anomaly: 213.6461 deg
Mean motion: 13.84189089 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 20033
Checksum: 287

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94168.04506144
Element set: 994
Inclination: 98.8342 deg
RA of node: 188.1798 deg
Eccentricity: 0.0016270
Arg of perigee: 12.5600 deg
Mean anomaly: 347.5966 deg
Mean motion: 14.01355709 rev/day
Decay rate: 1.99e-06 rev/day^2
Epoch rev: 19368
Checksum: 339

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94166.42933899
Element set: 809
Inclination: 82.5251 deg
RA of node: 147.3809 deg
Eccentricity: 0.0015084
Arg of perigee: 55.5160 deg
Mean anomaly: 304.7421 deg
Mean motion: 13.83582875 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 18751

Checksum: 316

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94165.05402871
Element set: 707
Inclination: 82.5402 deg
RA of node: 171.8070 deg
Eccentricity: 0.0012003
Arg of perigee: 189.1981 deg
Mean anomaly: 170.8923 deg
Mean motion: 13.16462951 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 15094
Checksum: 274

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94167.77197316
Element set: 65
Inclination: 98.6176 deg
RA of node: 195.5592 deg
Eccentricity: 0.0011704
Arg of perigee: 237.5342 deg
Mean anomaly: 122.4700 deg
Mean motion: 14.22417411 rev/day
Decay rate: 1.51e-06 rev/day^2
Epoch rev: 16047
Checksum: 286

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94165.39787066
Element set: 716
Inclination: 82.5511 deg
RA of node: 118.7158 deg
Eccentricity: 0.0011995
Arg of perigee: 200.3127 deg
Mean anomaly: 159.7518 deg
Mean motion: 13.16830820 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13609
Checksum: 309

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94166.12482262
Element set: 309
Inclination: 82.5483 deg
RA of node: 208.0682 deg
Eccentricity: 0.0020786

```
Arg of perigee: 230.0622 deg
Mean anomaly: 129.8705 deg
Mean motion: 13.83008846 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 3980
Checksum: 301

/EX
```

880. ORBS$168.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 14:59:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-168.m.1994@ampr.org>
Source record: 27588
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-168.M
Orbital Elements 168.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX June 17, 1994
BID: $ORBS-168.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94166.69145586
Element set: 291
Inclination: 98.6496 deg
RA of node: 242.5762 deg
Eccentricity: 0.0009469
Arg of perigee: 198.4521 deg
Mean anomaly: 161.6334 deg
Mean motion: 14.28029401 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 3748
Checksum: 330

Satellite: MIR
Catalog number: 16609
Epoch time: 94166.84966268
Element set: 642
Inclination: 51.6459 deg
RA of node: 193.0595 deg
Eccentricity: 0.0002890
Arg of perigee: 52.8807 deg
Mean anomaly: 307.2451 deg
Mean motion: 15.56338305 rev/day
Decay rate: 4.258e-05 rev/day^2
Epoch rev: 47583
Checksum: 335

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94167.81733476
Element set: 497
Inclination: 28.4697 deg
RA of node: 238.3578 deg
Eccentricity: 0.0006329
Arg of perigee: 84.7028 deg
```

Mean anomaly: 275.4269 deg
Mean motion: 14.90625547 rev/day
Decay rate: 5.04e-06 rev/day^2
Epoch rev: 2933
Checksum: 335

Satellite: GRO
Catalog number: 21225
Epoch time: 94165.55565142
Element set: 107
Inclination: 28.4608 deg
RA of node: 250.4142 deg
Eccentricity: 0.0003627
Arg of perigee: 181.0248 deg
Mean anomaly: 179.0350 deg
Mean motion: 15.40930339 rev/day
Decay rate: 2.803e-05 rev/day^2
Epoch rev: 5653
Checksum: 268

Satellite: UARS
Catalog number: 21701
Epoch time: 94167.84430509
Element set: 541
Inclination: 56.9849 deg
RA of node: 160.4316 deg
Eccentricity: 0.0005880
Arg of perigee: 102.9826 deg
Mean anomaly: 257.1873 deg
Mean motion: 14.96471238 rev/day
Decay rate: -2.012e-05 rev/day^2
Epoch rev: 15088
Checksum: 306

/EX

881. ORBS$168.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 15:00:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-168.n.1994@ampr.org>
Source record: 27586
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-168.N
2Line Orbital Elements 168.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX June 17, 1994
BID: $ORBS-168.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94161.37059705 -.00000089 00000-0 10000-3 0 2881
2 14129 27.0950 323.3862 6022573 185.3079 163.3129 2.05878627 82647
UO-11
1 14781U 84021B 94164.07495908 .00000165 00000-0 35885-4 0 7007
2 14781 97.7863 178.9927 0010944 287.1976 72.8030 14.69219433549701
RS-10/11
1 18129U 87054A 94163.98699348 .00000037 00000-0 23695-4 0 9094
2 18129 82.9229 331.9456 0013017 40.7525 319.4600 13.72338190349333
AO-13
1 19216U 88051B 94166.34337152 -.00000405 00000-0 10000-4 0 9248
2 19216 57.7884 247.1622 7213082 343.7462 2.0006 2.09724920 45974
FO-20
1 20480U 90013C 94165.87456846 -.00000065 00000-0 -69459-4 0 6975
2 20480 99.0376 318.1343 0541065 344.7655 13.7694 12.83225459203835
AO-21
1 21087U 91006A 94166.94154505 .00000094 00000-0 82657-4 0 4803
2 21087 82.9390 143.6297 0036919 86.0554 274.4806 13.74541473169410
RS-12/13
1 21089U 91007A 94165.54353671 .00000065 00000-0 52315-4 0 7007
2 21089 82.9214 13.4113 0030198 113.5767 246.8572 13.74042529168288
ARSENE
1 22654U 93031B 94167.12210594 -.00000100 00000-0 00000 0 0 2620
2 22654 1.8681 99.2228 2919369 183.9006 172.6566 1.42203062 1186
UO-14
1 20437U 90005B 94166.19574678 .00000057 00000-0 39150-4 0 22
2 20437 98.5879 250.9992 0010525 193.3603 166.7289 14.29846532229307
AO-16
1 20439U 90005D 94165.27176083 -.00000002 00000-0 16126-4 0 8016
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2 20439 98.5971 251.3159 0010737 197.6942 162.3867 14.29899811229188
DO-17
1 20440U 90005E 94165.71615950 .00000012 00000-0 21597-4 0 8016
2 20440 98.5984 252.0768 0010908 195.1875 164.8984 14.30039539229267
WO-18
1 20441U 90005F 94166.18122935 .00000026 00000-0 27064-4 0 8037
2 20441 98.5977 252.5380 0011436 194.4906 165.5950 14.30014120229337
LO-19
1 20442U 90005G 94165.73975260 .00000014 00000-0 22401-4 0 8009
2 20442 98.5974 252.3577 0011833 195.4192 164.6628 14.30109943229284
UO-22
1 21575U 91050B 94166.18613268 .00000058 00000-0 34055-4 0 5042
2 21575 98.4349 240.7242 0007185 303.1212 56.9305 14.36919228152790
KO-23
1 22077U 92052B 94167.69551354 -.00000037 00000-0 10000-3 0 3990
2 22077 66.0793 281.0075 0014358 287.6327 72.3125 12.86286638 86723
AO-27
1 22825U 93061C 94166.62421734 .00000022 00000-0 26645-4 0 2986
2 22825 98.6526 242.4464 0007983 211.0084 149.0633 14.27626226 37460
IO-26
1 22826U 93061D 94166.18484780 .00000030 00000-0 29892-4 0 2984
2 22826 98.6525 242.0491 0008198 216.6060 143.4552 14.27730366 37403
KO-25
1 22830U 93061H 94166.61624742 .00000038 00000-0 32793-4 0 3030
2 22830 98.5516 239.7422 0011533 176.8969 183.2290 14.28056827 37478
NOAA-9
1 15427U 84123A 94167.74678503 .00000084 00000-0 68618-4 0 8426
2 15427 99.0533 218.2332 0014197 218.9243 141.0907 14.13622176490280
NOAA-10
1 16969U 86073A 94167.73609929 -.00000017 00000-0 10932-4 0 7409
2 16969 98.5022 176.7464 0013788 335.5349 24.5180 14.24889628402540
MET-2/17
1 18820U 88005A 94168.23877222 .00000080 00000-0 57598-4 0 3126
2 18820 82.5406 268.5405 0016260 175.4425 184.6887 13.84717026322366
MET-3/2
1 19336U 88064A 94167.93501398 .00000051 00000-0 10000-3 0 2963
2 19336 82.5373 323.8588 0015676 265.2572 94.6761 13.16967664283222
NOAA-11
1 19531U 88089A 94167.78766704 .00000120 00000-0 89574-4 0 6621
2 19531 99.1721 156.6873 0012261 130.2107 230.0163 14.12994827295167
MET-2/18
1 19851U 89018A 94165.90933321 .00000043 00000-0 25085-4 0 2966
2 19851 82.5177 145.7365 0012706 230.6098 129.3939 13.84366225267372
MET-3/3
1 20305U 89086A 94167.77116453 .00000044 00000-0 10000-3 0 715
2 20305 82.5562 270.2734 0005343 297.9843 62.0727 13.04424679222844
MET-2/19
1 20670U 90057A 94166.13556307 .00000043 00000-0 24944-4 0 8018
2 20670 82.5472 210.0963 0016138 146.5713 213.6461 13.84189089200334
FY-1/2
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1 20788U 90081A 94168.04506144 .00000199 00000-0 15986-3 0 9941
2 20788 98.8342 188.1798 0016270 12.5600 347.5966 14.01355709193685
MET-2/20
1 20826U 90086A 94166.42933899 .00000041 00000-0 24023-4 0 8094
2 20826 82.5251 147.3809 0015084 55.5160 304.7421 13.83582875187518
MET-3/4
1 21232U 91030A 94165.05402871 .00000050 00000-0 10000-3 0 7071
2 21232 82.5402 171.8070 0012003 189.1981 170.8923 13.16462951150947
NOAA-12
1 21263U 91032A 94167.77197316 .00000151 00000-0 87300-4 0 650
2 21263 98.6176 195.5592 0011704 237.5342 122.4700 14.22417411160479
MET-3/5
1 21655U 91056A 94165.39787066 .00000051 00000-0 10000-3 0 7168
2 21655 82.5511 118.7158 0011995 200.3127 159.7518 13.16830820136091
MET-2/21
1 22782U 93055A 94166.12482262 .00000057 00000-0 38317-4 0 3099
2 22782 82.5483 208.0682 0020786 230.0622 129.8705 13.83008846 39800
POSAT
1 22829U 93061G 94166.69145586 .00000055 00000-0 39714-4 0 2915
2 22829 98.6496 242.5762 0009469 198.4521 161.6334 14.28029401 37480
MIR
1 16609U 86017A 94166.84966268 .00004258 00000-0 66135-4 0 6428
2 16609 51.6459 193.0595 0002890 52.8807 307.2451 15.56338305475833
HUBBLE
1 20580U 90037B 94167.81733476 .00000504 00000-0 35122-4 0 4979
2 20580 28.4697 238.3578 0006329 84.7028 275.4269 14.90625547 29333
GRO
1 21225U 91027B 94165.55565142 .00002803 00000-0 59949-4 0 1073
2 21225 28.4608 250.4142 0003627 181.0248 179.0350 15.40930339 56533
UARS
1 21701U 91063B 94167.84430509 -.00002012 00000-0 -15477-3 0 5417
2 21701 56.9849 160.4316 0005880 102.9826 257.1873 14.96471238150884
/EX
```

882. Re: Wanted: Copy of Wintrack 2.0

Newsgroup: rec.radio.amateur.space
Date: 1994-06-17 21:47:29 UTC
From: tom_boza@ccm.hf.intel.com
Message-ID: <2tt5nb$s6g@chnews.intel.com>
Source record: 27582

Cecil
If you receive is message, please respond. Im sending this to you
via the Intel CHNEWS server located on C2.
73s, Tom WB7ASR

In article <2to1r9$sdc@chnews.intel.com>, <cmoore@ilx018.intel.com> writes:
> Path: chnews!cmoore
> From: cmoore@ilx018.intel.com (Cecil A. Moore -FT-~)
> Newsgroups: rec.radio.amateur.space
> Subject: Wanted: Copy of Wintrack 2.0
> Date: 15 Jun 1994 23:11:37 GMT
> Organization: Intel Corp., Chandler AZ.
> Lines: 5
> Distribution: world
> Message-ID: <2to1r9$sdc@chnews.intel.com>
> NNTP-Posting-Host: scorpion.ch.intel.com
> X-Newsreader: TIN [version 1.1 PL8]
>
> How can a friend of mine obtain a copy of Wintrack 2.0? Is it
> shareware?
>
> thanks and 73, KG7BK, OOTC, CecilMoore@delphi.com
>

883. Hey

Newsgroup: rec.radio.amateur.space
Date: 1994-06-18 05:22:26 UTC
From: shawn.marlow@ectech.com
Message-ID: <94061813051611@ectech.com>
Source record: 27590

Hell to all of you from Moreno Valley, Ca. Just wanted to take the time to know who some of you are. I am currently 15 years old, I OWN and operate an amateur raido. My ID is Either KF6JE, or KF6WRB. I would like to know were some of you are from. Calf really sux at repeaters. I am current at advanced so i would like to hear some feed back from ya'all!

-- Shawn

884. unix satelite tracking program

Newsgroup: rec.radio.amateur.space
Date: 1994-06-18 10:57:42 UTC
From: mconway@deepthnk.kiwi.gen.nz
Message-ID: <-2129526818.7637656@deepthnk.deepthnk.kiwi.gen.nz>
Source record: 27591

I have a friend who is looking for a unix based program that can steer a satelite antenna i.e can track a satellite in an inclined orbit. Anyone know of such a program? If possible could you please send any replys to my friends internet address: dave@.ncs.co.nz but if this isnt possible I will be reading the newsnet board.

P.S he is also interested in the address of any place that sells 2nd hand satellite equipment i.e antennas etc.

Cheers
Mark

-- Mark
_/_/_/ _/_/_/_/ Mark Conway
_/ _/ _/ Deep Thought BBS, Auckland, New Zealand
_/ _/ _/ A FirstClass(tm) Macintosh GUI BBS
_/_/_/ _/ Internet: mconway@deepthnk.kiwi.gen.nz

885. Re: Wanted: Copy of Wintrack 2.0

Newsgroup: rec.radio.amateur.space
Date: 1994-06-18 12:36:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.1199.1818.0NC81E00@compart.fi>
Source record: 27583

-> > How can a friend of mine obtain a copy of Wintrack 2.0? Is it >
-> shareware?

That is not a shareware program. The program is made by
Paul E. Traufler. If you want more information about
WinTrack please contact to him. Address is

Paul E. Traufler
111 Emerald Drive
Harvest, AL 35749
U.S.A

Leo Wikholm, OH2JEC
e-mail: leo.wikholm@compart.fi

886. Satellite imagery

Newsgroup: rec.radio.amateur.space
Date: 1994-06-18 13:23:06 UTC
From: jmuise@opti.login.qc.ca
Message-ID: <81a5Nc2w165w@opti.login.qc.ca>
Source record: 27585

Can anyone tell me if any of the images generated by amateur satellites
have been made available for download in any other place besides directly
from the satellites themselves (eg. FTP or BBS downloads) ?
Thank you.

John.

887. Wefax on R-7000

Newsgroup: rec.radio.amateur.space
Date: 1994-06-18 14:21:46 UTC
From: "l.h. bol" <lbol@julian.uwo.ca>
Message-ID: <2tuvtq$7cs@falcon.ccs.uwo.ca>
Source record: 27584

Has anyone used the IF output of the R-7000 to drive a wide band IF system for the reception of Wefax and/or APT ? If so, can you provide info on the outboard IF system you used ?

lbol@julian.uwo.ca

888. Information Re: Satellite contacts on FD

Newsgroup: rec.radio.amateur.space
Date: 1994-06-18 19:19:32 UTC
From: SKSW80A@prodigy.com
Message-ID: <013.00861524.SKSW80A@prodigy.com>
Source record: 27589

Greetings.

I have never made a satellite contact on the OSCARs but am interested in doing so on FIELD DAY. I am in charge of field day at our local club here in Michigan and it will be my first attempt to work the satellite.

I have a program called TRAKSAT which will use the 2liners elements that are published on internet in this newsgroup to track the satellites but I have a few problems in using the output the program calculates for lack of additional information.

1. I am not sure what all the appreviations on the NASA format printout are for each satellite (i.e. I have heard that RS-10/11 is OSCAR 10 and OSCAR 11, but I don't know what AO-21, and many of the other satellites listed on the 2liners list. Is there a cross reference published somewhere on the net such in a mail-server from AMSAT or something like that?)

2. I need to know how to find out which mode a particular satallite is in or is suppose to be in during Field day, and what frequencies are being used for that mode. (or any day for that matter).

3. If I know which satellite I'm working, and I know which mode it is in, reference material should tell me the frequencies. However, my reference material on the satellites only covers some of the earlier models. Is there current information on the net regarding the new satellites and their modes of information?

Thanks to all who respond.

Jeff Johnson
KF8UW President, Blossomland Amateur Radio Association GRID EN-62
We will be using our club callsign W8MAI during field day.

889. Re: Hey

Newsgroup: rec.radio.amateur.space
Date: 1994-06-19 04:14:12 UTC
From: rkm@vectorbd.com
Message-ID: <CrMMFp.4o0@vectorbd.com>
Source record: 27592

Shawn Marlow (shawn.marlow@ectech.com) wrote:
: Hell to all of you from Moreno Valley, Ca. Just wanted to take the time
: to know who some of you are. I am currently 15 years old, I OWN and
: operate an amateur raido. My ID is Either KF6JE, or KF6WRB. I would like
: to know were some of you are from. Calf really sux at repeaters. I am
: current at advanced so i would like to hear some feed back from ya'all!

Don't you just hate it when you can't remember if you're
Karl F. Schmidt, or not? Or, for that matter, that your callsign
(excuse me, "ID") hasn't been allocated in region 6 yet?

- Rich

890. USED 10 METER COMMERCIAL ANTENNA FOR TVRO

Newsgroup: rec.radio.amateur.space
Date: 1994-06-19 19:18:51 UTC
From: Richard.Weening@Mixcom.com
Message-ID: <Richard.Weening.61.000E50DA@Mixcom.com>
Source record: 27593

WANTED...a 10 Meter Commercial Satellite Dish capable of zero degree on the horizon. An out-of-compliance 2-way dish if reasonable condition not operated near salt water may fill the fill. We have a licensed group who can disassemble and ship. Our application is TVRO so we need only one port. While the actuators should be in place, we do not need motors as we only need to watch a single bird.

Please forward details to GEMTECH@connectinc.com

891. A0-13 Operating Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-06-19 20:46:11 UTC
From: mmjjmm@post.its.mcw.edu
Message-ID: <2u2aqj$j9h@post.its.mcw.edu>
Source record: 27594

How can I determine the operating schedule for AO-13 on Field Day?

--
Michael J. Malloy Amateur Radio N9WJV
Medical College of Wisconsin Compuserve 70334,3563
Milwaukee, Wisconsin Internet mmjjmm@post.its.mcw.edu

892. ANS-168 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-19 22:43:18 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-168.01.1994@ampr.org>
Source record: 27595
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-168.01
1994 AMSAT FD COMPETITION

HR AMSAT NEWS SERVICE BULLETIN 168.01 FROM AMSAT HQ
SILVER SPRING, MD JUNE 18, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-168.01

1994 AMSAT Field Day Competition Announcement

Field Day is once again just around the corner on June 25th and 26th, and we are proud to announce the 1994 AMSAT Field Day competition. Last year's effort was very successful and we will be using the same special rules. The AMSAT competition is to encourage the use of all amateur satellites, including the digital satellites.

Here are the rules for the 1994 AMSAT Field Day competition.

1. ANALOG TRANSPONDERS

Each satellite is considered a separate band. All phone QSO's and all CW QSO's on a given satellite are considered separate bands. All packet/RTTY /ASCII/AMTOR QSO's are counted as CW QSO's. Phone QSO's count for one point and CW QSO's count for two points. Cross-mode contacts are not allowed. The use of more than one transmitter at the same time in a single band is prohibited.

2. DIGITAL TRANSPONDERS

Each satellite is considered a separate band. The following uploads/downloads each count as a CW contact (two points):

(a) Upload of a Satellite Field Day Greetings file.
(b) Download of Satellite Field Day Greetings files posted by other stations.

Satellite digipeat QSO's do not count for any score. The use of gateway stations to uplink/downlink is not allowed.

SAMPLE SATELLITE FIELD DAY GREETINGS FILE:

"Greetings from WA5ZIB Field Day Satellite station near Galveston, Texas with 24 participating members. All the best and 73!"

3. OPERATING CLASS

Stations supplied only with emergency power are in a separate operating class from those that utilize commercial power.

The Satellite Summary Sheet shown below should be used for submittal of the AMSAT Field Day competition results to Andy MacAllister WA5ZIB, Vice President User Services, 14714 Knights Way Drive, Houston, TX 77083-5640. Deadline for submissions is August 1, 1994.

Competition was tough in 1993 and should be even tougher in 1994. We hope this competition provides satellite operators with the practice necessary to be able to set up a ground station and effectively operate the satellites in an emergency situation. Remember that Field Day also provides a good opportunity to give some newcomers a chance at operating the satellites. Most of all, it should be a lot of fun for all who participate.

GOOD LUCK ON FD!

Satellite Summary Sheet - 1994

Satellite CW Phone

	x 2	x 1
Totals		

Your Field Day Callsign_____

Field Day Classification_____

Power Source(s)_____

Your name and home call_____

Home address_____

_____

Comments_____

_____

/EX
SB SAT @ AMSAT $ANS-168.02
AMSAT-NA BOD ANNOUNCEMENT

HR AMSAT NEWS SERVICE BULLETIN 168.02 FROM AMSAT HQ
SILVER SPRING, MD JUNE 18, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-168.02

AMSAT Board of Directors Nominations Announced

Martha Saragovitz, AMSAT's Corporate Secretary announced June 16, that six duly executed nominations for the organization's Board of Directors have been received at AMSAT Headquarters by the June 15th deadline mandated in the Radio Amateur Satellite Corporation Bylaws.

Ms. Saragovitz listed the nominees as: Keith Baker KB1SF, Tom Clark W3IWI, John Hansen WA0PTV, Andy McAllister WA5ZIB, Lou McFadin W5DID and Bob Myers W1XT.

The Corporation's Bylaws require that ballots for the Board election be mailed to all current members by July 15. To be counted, the properly marked ballots must be received at Headquarters by September 15. The three persons receiving the most votes will be declared elected to the Board for a two year period. The two receiving the next largest number will become Alternate Board members until next year's Board is seated at its fall 1995 meeting.

The current Board members who's terms expire this year are: Tom Clark W3IWI, Joe Kasser G3ZCZ and Andy McAllister WA5ZIB. Four other Board members were elected in 1993 and are scheduled to serve until next year. They are: Junior deCastro PY2BJO, Dick Daniels W4PUJ, Bob Diersing N5AHD and Bill Tynan W3XO.

The current Alternate Board member is Joe Holman KA7LDN.

/EX
SB SAT @ AMSAT $ANS-168.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 168.03 FROM AMSAT HQ
SILVER SPRING, MD JUNE 18, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-168.03

Weekly OSCAR Status Reports: 18-JUN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |

Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

KO-25: WH6I reports that at midweek Kitsat B (KO-25) again seemed to be on a different receive frequency. He notes that the BBS was there, but it was impossible to get any data from it. [WH6I]

LO-19: LO-19 is on the air but only telemetry is being sent and there are are no BBS functions operational. [WH6I]

KO-23: WH6I reports that KO-23 is busy and functioning normally. He notes that the images from last week are now gone. [WH6I]

AO-16: AO-16 is running strong, the only 1200 baud bird in operation at the present time. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0LJF.#NECO.CO.USA.NOAM. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

893. APT-Satellites: Report JUNE 19, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-06-20 08:21:44 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-200694082005@129.26.163.250>
Source record: 27596

```
Observed at station 50.7 NLat, 7.1 ELon, JUNE 19, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On
Meteor 3-5: APT 137.85 ON again

vis-APT of Meteor 3-5 is active again, transmitting good
images from afternoon ascending orbits. Meteor 2-21 (the
weak APT-Transmitter) now drifts towards early morning.
```


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

894. Student Pro Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-06-20 16:33:49 UTC
From: gamageb@news.db.erau.edu
Message-ID: <2u4gdd$ri4@blackbird.db.erau.edu>
Source record: 27597

Dear Colleague:

Student Space Action would like to inform you of a way
in which you can directly voice your support for manned
space exploration. As you read this, your space program is
in danger of becoming extinct. Congress is once again
attempting to eliminate space station funding. Cancellation
of the space station could mean the phase-out of space exploration
and eventual termination of aerospace industries and job
opportunities. The resulting impact on the nation's economy,
technology and educational system would be disastrous.

You can tell your congressmen exactly how much you support the
space station and the manned space initiative by signing the
Student Space Action's Interactive Online Petition. Simply follow
these steps:

telnet seds.lpl.arizona.edu
login> space

Now answer the questions to the best of your ability
(read the directions accompanying the petition--
use <tab> to enter answer; <enter> to toggle yes/no;
up/down arrows to go backwards and forwards through
questions. Caution: if floating characters appear on
your screen--ignore--it's probably just an emulation
problem. Your petition will still be signed.

After you submit the petition, you will receive information
on your congressmen and senators so you can contact them further
by phone or mail if you desire.

The petition is also accessible by NCSA Mosaic. Simply go to the
following URL and follow the directions:

URL: http://seds.lpl.arizona.edu/ssa/petition.html

Answer the questions and submit the petition and you
will receive the same information as the telnet version.
You will also have the option of linking to the space
station home page where you can read up-to-date information
on the space station, including issues of "Space Station
This Week."

Please forward this message to anyone you may feel would want to
be a part of this effort--everyone!

If you believe the space program is a vital part of our country's future, both in economic growth and technological advancement, then sign the Student Space Action's Interactive Petition.

If you believe that NASA should remain as an engine for continued manned space exploration, then tell everyone you know to sign this petition.

If you believe that our government, by supporting an initiative like the space station, is making an investment in the future generation of this great nation, then send your message to Washington by signing the Student Space Action Interactive Petition.

SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

Student Space Action

--
---Brian Gamage

____
| "All we need to ...is make sure... |
| we...keep talking. |
| --Stephen Hawking |
| from Pink Floyd's Division Bell|
|Space Technology Editor |
|The Avion Newspaper |
|Embry Riddle Aeronautical University |
|Student Space Action |
|Recent "The Club" Activist |
|email: gamageb@db.erau.edu |
|_____________________________________|

895. * SpaceNews 20-Jun-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-06-20 18:02:42 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0620.1994@ampr.org>
Source record: 27370
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0620
* SpaceNews 20-Jun-94 *

BID: $SPC0620

=========
SpaceNews
=========

MONDAY JUNE 20, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* IMPACT WITH JUPITER *
=======================
JPL's Galileo spacecraft is scheduled to observe 16 of the 21 possible impacts of the fragments of Comet Shoemaker-Levy-9 with Jupiter this July, according to project scientist Dr. Torrence Johnson. Galileo is scheduled to observe 16 of the 21 possible impacts of the fragments of Comet Shoemaker-Levy-9 with Jupiter this July.

Galileo, however, won't be alone in keeping its eyes on Jupiter. Although the Galileo spacecraft will be in the best position to view Comet Shoemaker-Levy-9's impact with Jupiter, Voyager 2 and the Ulysses spacecraft will record various measurements from the event.

On its way out of the solar system, Voyager 2 will be heading south, about 6 billion kilometers (3.7 billion miles) from Jupiter, and will have the comet's impact sites in its line of sight. The spacecraft will observe with its ultraviolet spectrometer and planetary radio astronomy instrument, and numerical data will be returned in real time.

The Ulysses spacecraft, on its way to explore the sun's polar regions, will be able to make measurements of radio and plasma waves from the comet's impact from its position at about 75 degrees south of the sun's equator and about 800 million kilometers (500 million miles) from Jupiter.

JPL's Deep Space Network facility at Goldstone, California will perform radio astronomy on the synchrotron emission from Jupiter's radiation belt, looking for disturbances caused by Shoemaker-Levy dust.

[Info via Ron Baalke at JPL]

* MIR NEWS *
============
Progress M-23 docked with the Mir complex at 0618 UTC on May 24. The EO-15

commander and flight engineer, Viktor Afanas'ev and Yuriy Usachyov, will be replaced this month by the EO-16 crew, Yuriy Malenchenko and Talgat Musabaev, who will be launched on the Soyuz TM-19 ferry ship on June 20. Physician-cosmonaut Valeriy Polyakov will remain aboard Mir. Both Malenchenko, a Russian Air Force cosmonaut, and Musabaev, a Kazakh Space Agency cosmonaut, will be on their first flights.

[Info via Jonathan McDowell]

* AO-10 NEWS *
==========
JH0OTM in Japan reports getting a strong return downlink from AMSAT-OSCAR-10 on 13-Jun-94 at 23:30 UTC. The beacon carrier on 145.810 MHz was also strong at a range of 23000 km. With signals from AO-10 steadily improving, JH0OTM is looking forward to making contacts via AO-10's Mode B transponder.

* DOVE NEWS *
==========
DOVE-OSCAR-17 continues to exercise its voice capabilities. Downlinks can be heard on 145.825 MHz FM. The following packet frame was received from by spacecraft by KD2BD late last week:

DOVE-1>BRAMST <UI>:

Greetings to attendees at the ARRL National Convention and
Education Forum from the DOVE Command Team
(WD0E)

* SPACE CALENDAR *
==========
The following is a tentative calendar of space related events for the next several weeks.

Jun 20-23 - International Conference of Environmental Systems, Germany
Jun 24 - UHF Follow-On Atlas Launch
Jun 24 - Soyuz TM-19 Launch (Russian)
Jun 25-26 - Space Auction, Superior Galleries, Beverly Hills, California
Jun 25-26 - Universe 94 Conference, Flagstaff, Arizona
Jun 27 - Ulysses, Begin of 1st Solar Passage (-70.07 degrees latitude)

Jul 04 - Soyuz TM-18 Landing (Russian)
Jul 08 - STS-65, Columbia, International Microgravity Lab #2 (IML-2)
Jul 09 - 15th Anniversary (1979), Voyager 2, Jupiter Flyby
Jul 11 - 15th Anniversary (1979), Skylab Re-enters Earth's Atmosphere
Jul 16-22 - Comet Shoemaker-Levy 1993e Collision with Jupiter
Jul 16 - 25th Anniversary (1969), Apollo 11 Launch
Jul 20 - 25th Anniversary (1969), Man on the Moon (Apollo 11)
Jul 28 - 30th Anniversary (1964), Ranger 7 Launch (Moon Impact Mission)
Jul 28 - DirectTV Atlas II Launch
Jul 31 - 25th Anniversary (1969), Mariner 6, Mars Flyby

[Info via Ron Baalke at JPL]

* FO-20 NEWS *
==============
On 19-May-94, the FO-20 command station announced that a problem exists
in FO-20's onboard computer system. The satellite's transponder will
remain in the analog mode (JA) until further notice.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

N1OHJ ON1EN VK3DHT KJ5TF VK5KCI

* FEEDBACK/INPUT WELCOMED *
==========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@amsat.org -or- magliaco@pilot.njin.net

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

896. Satellite FAQ is very helpful for preparing for Field Day.

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 14:16:18 UTC
From: johnsoj@autsb.allied.com
Message-ID: <199406211416.JAA07654@news.cs.utexas.edu>
Source record: 27598

Since I posted my question regarding how to make a satellite contact on field day, and since no one responded to that message, I figured that there must me some information (read FAQ) at one of the known amateur radio mirror sites. I must have missed when it was posted to this newsgroup.

I ftp'd to oak.oakland.edu:/pub/hamradio/docs/faq and got the file faq_sats.txt. This document is very helpful to me. With this in hand, along with the output for my location from one of the tracking programs which uses the 2liner element sents for the Satellites, I will be in fine shape for field day.

I hope that this message will be helpful to other hams interested in trying to work a satellite on field day.

KF8UW
Jeff Johnson

897. Online (Pro) Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 14:28:43 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <2u6ter$88l@news.CCIT.Arizona.EDU>
Source record: 27599

Dear Colleague:

Student Space Action would like to inform you of a way in which you can directly voice your support for manned space exploration. As you read this, your space program is in danger of becoming extinct. Congress is once again attempting to eliminate space station funding. Cancellation of the space station could mean the phase-out of space exploration and eventual termination of aerospace industries and job opportunities. The resulting impact on the nation's economy, technology and educational system would be disastrous.

You can tell your congressmen exactly how much you support the space station and the manned space initiative by signing the Student Space Action's Interactive Online Petition. Simply follow these steps:

telnet seds.lpl.arizona.edu
login> space

Now answer the questions to the best of your ability
(read the directions accompanying the petition--
use <tab> to enter answer; <enter> to toggle yes/no;
up/down arrows to go backwards and forwards through
questions. Caution: if floating characters appear on
your screen--ignore--it's probably just an emulation
problem. Your petition will still be signed.

After you submit the petition, you will receive information
on your congressmen and senators so you can contact them further
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The petition is also accessible by NCSA Mosaic. Simply go to the following
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station home page where you can read up-to-date information
on the space station, including issues of "Space Station
This Week."

Please forward this message to anyone you may feel would want to be a part
of this effort--everyone!

If you believe the space program is a vital part of our country's future,
both in economic growth and technological advancement, then sign the

Student Space Action's Interactive Petition.

If you believe that NASA should remain as an engine for continued manned space exploration, then tell everyone you know to sign this petition.

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SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

Student Space Action
ssa@seds.lpl.arizona.edu

898. Online (Pro) Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 14:37:07 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <2u6tuj$8c4@news.CCIT.Arizona.EDU>
Source record: 27600

Dear Colleague:

Student Space Action would like to inform you of a way in which you can directly voice your support for manned space exploration. As you read this, your space program is in danger of becoming extinct. Congress is once again attempting to eliminate space station funding. Cancellation of the space station could mean the phase-out of space exploration and eventual termination of aerospace industries and job opportunities. The resulting impact on the nation's economy, technology and educational system would be disastrous.

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SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

Student Space Action
ssa@seds.lpl.arizona.edu

899. C200 controller

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 16:35:26 UTC
From: colink@CSOS.ORST.EDU
Message-ID: <2u74se$41u@jadzia.CSOS.ORST.EDU>
Source record: 27606
Cross-posted to: rec.radio.amateur.equipment,rec.radio.amateur.space

I would like to know if any of you "Packet Hackers" have any info. on a Contronics C200 Micro Earth Station.
It was manufactured by Contronics. The division that made it is no longer in operation. It was bought out by GTE Spacenet. They will not give me any info on it. Depending on who you talk to you will get conflicting stories. Some say the info is proprietary some say it is not. The only info they have sent me is for a 40 foot earth listing station. The one I have is a scaled down model. ie:2.5 meter.
I hope to use this for packet radio someday. I am in the process of acquiring my "Ham" license now. Can anyone tell me how to use this "dish" and controller for listening purposes.
The "dish" came from a Farmers insurance agent that went out of business. I acquired it at an auction.
I can be reached at colink@kira.csos.orst.edu Thanks...Colin.

900. C200 controller

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 16:40:24 UTC
From: colink@CSOS.ORST.EDU
Message-ID: <2u755o$42j@jadzia.CSOS.ORST.EDU>
Source record: 27607

I would like to know if any of you "Packet Hackers" have any info. on a Contronics C200 Micro Earth Station.
It was manufactured by Contronics. The division that made it is no longer in operation. It was bought out by GTE Spacenet. They will not give me any info on it. Depending on who you talk to you will get conflicting stories. Some say the info is proprietary some say it is not. The only info they have sent me is for a 40 foot earth listing station. The one I have is a scaled down model. ie:2.5 meter.
I hope to use this for packet radio someday. I am in the process of acquiring my "Ham" license now. Can anyone tell me how to use this "dish" and controller for listening purposes.
The "dish" came from a Farmers insurance agent that went out of business. I acquired it at an auction.
I can be reached at colink@kira.csos.orst.edu Thanks...Colin.

901. Satellite images

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 21:34:15 UTC
From: jmuise@opti.login.qc.ca
Message-ID: <sRHaoc1w165w@opti.login.qc.ca>
Source record: 27604

Can anyone tell me if there is an FTP site or BBS which would allow the download of amateur satellite images. (Other than direct download from the satellite itself) ?

Thank you.
John.

902. Wanted: Satellite Gear

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 21:51:09 UTC
From: mmjjmm@post.its.mcw.edu
Message-ID: <2u7ncd$3pi@post.its.mcw.edu>
Source record: 27602

I am interested in obtaining gear for a satellite station. I need most things and am particularly interested in a Yaesu FT-736R. If you have satelllite equipment for sale or you want to upgrade send e-mail.

--
Michael J. Malloy Amateur Radio N9WJV
Medical College of Wisconsin Compuserve 70334,3563
Milwaukee, Wisconsin Internet mmjjmm@post.its.mcw.edu

903. Ham/Macintosh BBS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 23:04:33 UTC
From: peterd@cais2.cais.com
Message-ID: <2u7rm1$ikn@sun.cais.com>
Source record: 27608

Gallery's BBS moved to a new phone number at 202-298-6009.
We feature Macintosh shareware for ham radio and other general use
files for the Mac.The system is free and all callers are welcome.No
download/upload ratios or any other restrains.
Settings are standard modem ones and it supports calls up to 9600 bd
Thanks for reading this and hope to see a few more users logging in..
73's de Paulo,N3MGA
paulot@cais2.cais.com

904. Relays

Newsgroup: rec.radio.amateur.space
Date: 1994-06-21 23:09:39 UTC
From: tom_boza@ccm.hf.intel.com
Message-ID: <2u7sll$442@chnews.intel.com>
Source record: 27603
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc,rec.radio.amateur.homebrew,rec.radio.amateur.equipment,rec.radio.amateur.antenna,intel.ham-radio

Can anyone tell me where I might find (purchase cheaply) some 12-24 VDC
relays that I can use to switch in/out my 2m and 70cm antenna preamps?
I need to take the premaps out-of-line before transmitting. They need to
operate at 145 and 443 MHz with minimum signal lost and capable of handling
150 watts of RF output power. I perfer PC mount type so I can mount them inside
the preamp bud box. Coaxial relays (Dowell or TohTus) are big and require coax
connectors.

Thanks, Tom WB7ASR...

tom_boza@ccm.hf.intel.com

905. Macintosh tracking programs

Newsgroup: rec.radio.amateur.space
Date: 1994-06-22 02:44:40 UTC
From: winter@apple.com
Message-ID: <2u88io$pco@apple.com>
Source record: 27605

I've seen some requests for Macintosh satellite tracking programs
on this newsgroup recently. Here are the ones listed in Terry
Stader (KA8SGP)'s Mac ham software list.

FWIW, I use SatTrak and MacSPOC myself.

Patty

============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

<SatTrak v1.02>
Tracks one satellite across a world map as it moves, displays the
instantaneous position of several satellites, or generates tables of
all satellites visible from a certain location at a given time. Also
calculates beam headings, Maidenhead grid locations, and MUFs.
Shareware. Available via anonymous FTP from sumex-aim.stanford.edu
(/info-mac/app). Or send a formatted 800K Macintosh disk with
stamped, self-addressed disk mailer to Mike Pflueger, WD8KPZ, 6207
W. Beverly Lane, Glendale, AZ 85306.

<MacSat v3.1>
Tracks up to 21 satellites simultaneously, either in simulation or
real-time mode. Text screen displays ground-track coordinates,
range, mean anomaly, visibility (azimuth and elevation) and Doppler
shift frequency information for all satellites being tracked.
Graphical screen portrays the satellite ground tracks superimposed
on a world map. Polar plot displays graphically the precise location
of each visible satellite above the observer's horizon. Developed
by the Geodetic Research Laboratory of the University of New
Brunswick. Available from Richard B. Langley, R.R. 12, Fredericton,
N.B. E3B 6H7, Canada (Internet: lang@unb.ca). A demo version of
MacSat may be ftp'ed from directory PUB.CANSPACE on unbmvs1.csd.unb.ca.
System 7

<OrbiTrack> <OrbiTrackFPU v2.1.4>
Calculates look angles to selected satellites, plots current
satellite positions on a world map, and displays the visible passage
of a satellite against background stars (either within the program
itself or via a data file that can be read into the Voyager
astronomy program). Please note that one version requires an FPU to
operate! BEK Developers, P.O. Box 47114, St. Petersburg, FL 33743.

(Bill Bard, CompuServe: 75366,2557) (Note: This replaces BEK's previous MacSat program, which was not related to the program of the same name from UNB.)

<QuikMac>
Macintosh version of N4HY's QuikTrak program. Requires Microsoft BASIC. AMSAT, P.O. Box 27, Washington, DC 20044.

<Satellite Orbit Prediction Program>
Macintosh conversion of W3IWI program. Requires Microsoft BASIC. Send formatted 800K Macintosh disk with stamped, self-addressed disk mailer to Earl Skelton, N3ES, 6311 29th Place NW, Washington, DC 20015. Or send self-addressed stamped envelope for source listing.

<Satellite Pro>
Uses world maps and tables to indicate rising and setting schedules, current locations, mutual visibility opportunities, and footprints. Includes Mercator, polar, and great-circle displays. Optional antenna control. MacTrak Software, P.O. Box 1590, Port Orchard, WA 98366.

<Macintosh Spacecraft Personal Orbit Computations (MacSPOC)>
Software used aboard the Space Shuttle and in Mission Control to track the Shuttle. Models engine burns, orbit perturbations, and the Shuttle's orientation. Free online data uploads during Shuttle missions.
Commercial v1.5 available from Daniel R. Adamo, 4203 Moonlight Shadow Ct., Houston, TX 77059; telephone 713-480-9631; AppleLink: D3176; America Online: AdamoD. Test drive v1.1 available on AppleLink (path "K-12 Education: Education Resources: Science Resources: MacSPOC: Space Shuttle Orbit Software"). Author is on AOL and can be reached as adamod@aol.com via the internet.

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people in the world, and I never even noticed." --Columbo
================================= N6BIS =================================

906. Re: Macintosh tracking programs

Newsgroup: rec.radio.amateur.space
Date: 1994-06-22 12:47:16 UTC
From: sehrlich@dogbert.dac.neu.edu
Message-ID: <2u9bsk$sd0@dogbert.dac.neu.edu>
Source record: 27609

Please don't forget there is also some good stuff on Oakland:

oak.oakland.edu:/pub/hamradio/mac/space

Scott

--
Scott Ehrlich, Amateur Radio Callsign: wy1z
How to reach me: wy1z@neu.edu [Internet], wy1z@wa1phy.ma [Packet]
Boston ARC ftp archives: ftp oak.oakland.edu /pub/hamradio
Boston ARC Web page: http://www.acs.oakland.edu/barc.html

907. FTP Sites or freeware for Oscar TLM Decoding

Newsgroup: rec.radio.amateur.space
Date: 1994-06-22 14:57:58 UTC
From: jernandez@pbs.org
Message-ID: <jernandez-220694095758@jernandez.pbs.org>
Source record: 27367

Can someone please help me with the location of a telemetry decoding program for Oscar satellites. An FTP site would be the best, but I will also be glad to get info on Freeware which is available.

TNX
73
John

--
John J. Ernandez
Communication Systems Engineer
Public Broadcasting Service

E-Mail jernandez@pbs.org Member:PRR Technical & Historical Society
Phone: 703-739-5474 Southern Railway Historical Association
Amateur Radio: KA2YAP

908. DSP-12 users/programmers

Newsgroup: rec.radio.amateur.space
Date: 1994-06-22 19:46:49 UTC
From: bmm1@freenet3.scri.fsu.edu
Message-ID: <2ua4f9$c8@freenet3.scri.fsu.edu>
Source record: 27610
Cross-posted to: rec.radio.amateur.digital.misc,rec.radio.amateur.space,rec.radio.scanner

I have been using an L.L.Grace DSP-12 for about a year now and am
happy with it. It is a very powerful piece of equipment and is under
utilized with it's present firmware. Is anyone doing any programming
for this device? Is firmware version 2.0 the latest? Is the AEA DSP
unit programmable and if so are programs written for it compatible
with the DSP-12? Any info or opinions welcomed.

Thanks
Bruce N4USH
--
Bruce M. Marshall bmm1@freenet.fsu.edu voice 615 481 0990 fax 615 481 8039

909. DROP

Newsgroup: rec.radio.amateur.space
Date: 1994-06-22 19:48:00 UTC
From: t.smith@cccbbs.cincinnati.oh.us
Message-ID: <1.572.uupcb@cccbbs.cincinnati.oh.us>
Source record: 27361

```
-- Jabber Control Message --

---
. JABBER v1.2 .
```

910. age-ID: <2tr5jf$b1q@search01.news.aol.com>&#65533;TS>Newsgroups: r

Newsgroup: rec.radio.amateur.space
Date: 1994-06-22 21:39:00 UTC
From: : tomsunman@aol.com&#65533;TS;
Message-ID: <90.395.614@mgmtsys.com>
Source record: 27368

radio.amateur.space
TS>Organization: America Online, Inc. (1-800-827-6364)

TS> I've been saving the 2 line element sets from this newsgroup and
TS>they are NOT working with stsorbit plus. I remove the info before the
TS>actual set and the program will not read it. I don't quite understand
TS>why. Any help would be appreciated through e-mail. In the meantime,
TS>I'll have to go elsewhere for the latest sets. Thanks!

TS>Tom

TS>randall@sunydutchess.edu

I believe that the information posted in r.radio.space is in the form of
Keplerian data and the stsplus software uses 2-line element sets. While
these contain essentially the same data, the format is different.

However, the version of the software I have contains an option to
manually input the Kep data from the posted listing and it (the
software) builds the 2-line element set. I can't remember offhand just
what version I have......

Someone who uses this stuff regularily can probably give a better
explaination.....

__________Internet: jeff.sigley@mgmtsys.com Amateur: N8UBI_____

&#65533; CmpQwk #UNREG&#65533; UNREGISTERED EVALUATION COPY

911. Re: DSP-12 users/programmers

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 02:40:05 UTC
From: hansen@jane.cs.fredonia.edu
Message-ID: <1994Jun23.024005.14683@penny.cs.fredonia.edu>
Source record: 27362
Cross-posted to: rec.radio.amateur.digital.misc,rec.radio.amateur.space,rec.radio.scanner

Bruce M. Marshall (bmm1@freenet3.scri.fsu.edu) wrote:
: I have been using an L.L.Grace DSP-12 for about a year now and am
: happy with it. It is a very powerful piece of equipment and is under
: utilized with it's present firmware. Is anyone doing any programming
: for this device?

There have been some interesting applications developed but they are few and far between. I have an oscilloscope program that Brooks gave me a year or so ago (but I don't know whether it is available for public distribution). Also right now there are some audio filters posted on Ko-23. I've not tried them yet but they look interesting.

: Is firmware version 2.0 the latest?

yes
: Is the AEA DSP
: unit programmable and if so are programs written for it compatible
: with the DSP-12? Any info or opinions welcomed.

They are not compatible... if I'm not mistaken it even uses a different DSP chip.

You may or may not know that LL Grace has a developer's kit for sale for $25. I know Brooks has been puzzled as to why there has not been more development activity. One reason, I think, is that there is no way to upload additional programs to the unit. If you upload new firmware it replaces what is in ROM, it doesn't augment it. So you go through an upload proceedure to put an additional program in, but the next time you want a 9600 baud modem you have to default to the ROM, but if you want the new program you have to upload it again. You really have to think twice before deciding to upload

73, John

912. Freqs for ham sats

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 07:22:00 UTC
From: barkman@zeta.is.tcu.edu
Message-ID: <1994Jun23.022422.187@news.tcu.edu>
Source record: 27363

Anyone have a list of satellites and their uplink/downlink freqs?
Also looking for weather satellite freqs if you gotem.

thanks

myles KG5AI
.

913. <<Need sat freqs for Field Day!>>

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 09:47:32 UTC
From: penneys@brahms.udel.edu
Message-ID: <2ublnk$70b@brahms.udel.edu>
Source record: 27364
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

Help!! Need freqs and specs for any satellites workable on HF, and
on 10M - 2M - 440, as well as modes (CW, FM, SSB, whatever), whether
they're mirror image, could hit with low ERP, etc.

Sorry for blanket ignorance. Tnx Bob

--
Bob Penneys, WN3K Frankford Radio Club N.E.R.D.S.
Internet: penneys@brahms.udel.edu Mail: 12 E. Mill Stn. Dr., Newark, DE 19711 Work: Ham
Radio Outlet (DE) 800-644-4476, 9:30-5:30 Eastern Fax: 302-322-8808

914. Satellite Tracking Routines

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 10:33:56 UTC
From: sc_s530@dcs.king.ac.uk
Message-ID: <2uboek$mkc@mercury.king.ac.uk>
Source record: 27366

I don't know whether there are any experienced programmers out there who would be willing to help me out but here is the problem. For my final-year degree project I am building an automatic satellite tracking system and I need to know how to calculate the current position of a satellite from Keppler Elements.

I presume all that is required is a few formulas, functions of time, but my maths is not up to working it out the hard way. If anyone knows what these formulas are and could mail them to me I would be grateful. (You will be sure to get your name in the acknowledgments.)

I am writing the software in C, if that helps any. Please send any mail direct - preferrably to the address as the bottom of this post - and I will summarize if there is anything of interest.

Thanks in advance,

-Niall

--=*******=--
Niall Pagdin, Student Advisory (SC), Kingston University,
Kingston-upon-Thames, London, England.
E~Mail: niall@crystal.king.ac.uk

- G7PDX -

"Only those who attempt the absurd, achieve the impossible!"

915. Hamsat alias list

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 10:56:31 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <17793.djmullen@facstaff.wisc.edu>
Source record: 27365

Here's a list of the various different names used by our Amateur Sats.
I don't claim it's complete. If you know of any names or aliases I've
missed, please send me a message and I'll update this list. N9LTD

NORAD Common Name [Aliases] (Parent satellite)
----- ---------- --------------------------- ---------------------------
14129 AO-10 [OSCAR 10, Phase 3B]
14781 UO-11 [OSCAR 11, UOSAT-B, UOSAT 2]
16609 Mir
18129 RS-10/11 [RS-10] (COSMOS 1861)
19216 AO-13 [OSCAR 13, Phase 3C]
20437 UO-14 [OSCAR 14, UOSAT-OSCAR 14]
20438 UO-15 [OSCAR 15, UOSAT-OSCAR 15]
20439 AO-16 [OSCAR 16, Pacsat, Microsat-A]
20440 DO-17 [OSCAR 17, DOVE, Microsat-B]
20441 WO-18 [OSCAR 18, WEBERSAT, Microsat-C]
20442 LO-19 [OSCAR 19, LUSAT, Microsat-D]
20480 FO-20 [Fuji-OSCAR 20] (JAS 1-B)
21087 AO-21 [OSCAR 21, RS-14, RUDAK-II] (INFORMTR-1 or INFORMATOR-1)
21089 RS-12/13 [RS-12] (COSMOS 2123)
21575 UO-22 [OSCAR 22, UoSat 5, UOSAT-F]
22077 KO-23 [OSCAR 23, KITSAT A, Uribyol 1]
22654 ARSENE
22825 AO-27 [OSCAR 27, AMRAD] (EYESAT-1)
22826 AO-26 [ITAMSAT, IO-26, OSCAR 26]
22829 PO-28 [POSAT, POSAT 1, OSCAR 28]
22830 KO-25 [KITSAT B, OSCAR 25, Uribyol 2]

Errors, updates, fan mail or flames to djmullen@facstaff.wisc.edu

916. Trakbox help

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 13:55:31 UTC
From: mkl@uwasa.fi
Message-ID: <2uc48j$6lk@zippo.uwasa.fi>
Source record: 27369

Gear: Trakbox with 3.20beta ROM
Yaesu 736R

Problem: Can't get CAT control to work

I have connected the CAT control from CN4 pins 2 (inverted TTL)
and 5 (GND). Now and then the radio goes into CAT mode but it
won't trak the frequency right. Are there any quirks to get it
working properly?

If you have a similar configuration please write and tell me
about how it works for you.

--
Markus

917. ARLK024 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 15:37:29 UTC
From: w1aw@arrl.org
Message-ID: <$arlk024.1994@ampr.org>
Source record: 27375
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK024
ARLK024 Keplerian data

ZCZC SK91
QST de W1AW
Keplerian Bulletin 24 ARLK024
From ARRL Headquarters
Newington, CT June 18, 1994
To all radio amateurs

SB KEP ARL ARLK024
ARLK024 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94189.74191699 .00027158 30948-8 84442-4 0 10
2 99965 28.4683 13.2285 0003452 327.1219 272.8160 15.90322967 12
AO-10
1 14129U 83058B 94161.37059705 -.00000089 00000-0 10000-3 0 2881
2 14129 27.0950 323.3862 6022573 185.3079 163.3129 2.05878627 54679
RS-10/11
1 18129U 87054A 94163.98699348 .00000037 00000-0 23695-4 0 9094
2 18129 82.9229 331.9456 0013017 40.7525 319.4600 13.72338190349333
UO-11
1 14781U 84021B 94164.07495908 .00000165 00000-0 35885-4 0 7007
2 14781 97.7863 178.9927 0010944 287.1976 72.8030 14.69219433549701
RS-12/13
1 21089U 91007A 94165.54353671 .00000065 00000-0 52315-4 0 7007
2 21089 82.9214 13.4113 0030198 113.5767 246.8572 13.74042529168288
AO-13
1 19216U 88051B 94166.34337152 -.00000405 00000-0 10000-4 0 9248
2 19216 57.7884 247.1622 7213082 343.7462 2.0006 2.09724920 14475
UO-14
1 20437U 90005B 94166.19574678 .00000057 00000-0 39150-4 0 22
2 20437 98.5879 250.9992 0010525 193.3603 166.7289 14.29846532229307
AO-16
1 20439U 90005D 94165.27176083 -.00000002 00000-0 16126-4 0 8016
2 20439 98.5971 251.3159 0010737 197.6942 162.3867 14.29899811229188
```

```
DO-17
1 20440U 90005E 94165.71615950 .00000012 00000-0 21597-4 0 8016
2 20440 98.5984 252.0768 0010908 195.1875 164.8984 14.30039539229267
WO-18
1 20441U 90005F 94166.18122935 .00000026 00000-0 27064-4 0 8037
2 20441 98.5977 252.5380 0011436 194.4906 165.5950 14.30014120229337
LO-19
1 20442U 90005G 94165.73975260 .00000014 00000-0 22401-4 0 8009
2 20442 98.5974 252.3577 0011833 195.4192 164.6628 14.30109943229284
FO-20
1 20480U 90013C 94165.87456846 -.00000065 00000-0 -69459-4 0 6975
2 20480 99.0376 318.1343 0541065 344.7655 13.7694 12.83225459203835
AO-21
1 21087U 91006A 94166.94154505 .00000094 00000-0 82657-4 0 4803
2 21087 82.9390 143.6297 0036919 86.0554 274.4806 13.74541473169410
UO-22
1 21575U 91050B 94166.18613268 .00000058 00000-0 34055-4 0 5042
2 21575 98.4349 240.7242 0007185 303.1212 56.9305 14.36919228152790
KO-23
1 22077U 92052B 94167.69551354 -.00000037 00000-0 10000-3 0 3990
2 22077 66.0793 281.0075 0014358 287.6327 72.3125 12.86286638 86723
KO-25
1 22830U 93061H 94166.61624742 .00000038 00000-0 32793-4 0 3030
2 22830 98.5516 239.7422 0011533 176.8969 183.2290 14.28056827 37478
IO-26
1 22826U 93061D 94166.18484780 .00000030 00000-0 29892-4 0 2984
2 22826 98.6525 242.0491 0008198 216.6060 143.4552 14.27730366 37403
AO-27
1 22825U 93061C 94166.62421734 .00000022 00000-0 26645-4 0 2986
2 22825 98.6526 242.4464 0007983 211.0084 149.0633 14.27626226 37460
PO-28
1 22829U 93061G 94166.69145586 .00000055 00000-0 39714-4 0 2915
2 22829 98.6496 242.5762 0009469 198.4521 161.6334 14.28029401 37480
Mir
1 16609U 86017A 94166.84966268 .00004258 00000-0 66135-4 0 6428
2 16609 51.6459 193.0595 0002890 52.8807 307.2451 15.56338305475833

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
June 21, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

918. WX FTP sites.

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 18:22:40 UTC
From: gosset@pbr322.ceingebi.unam.MX
Message-ID: <Pine.3.87.9406231840.A25337-0100000@pbr322>
Source record: 27373

The following is a list of anonymous FTP sites where metereological
images in GIF format can be found.

73 de Guillermo.

=-=
CLIMLIST Mailing Number 92-08-19
Forwarded From: USENET newsgroup sci.geo.meteorology
Origin: ilana@ncar.ucar.edu

==Current weather GIFs via FTP==

vmd.cso.uiuc.edu [128.174.5.98]
FTP: Change directory to "wx" and set transfer type to "binary".
GOES-7 visible and IR imagery over the US and Mexico, and surface analyses
over the US, are available. A script to retrieve GIFs automatically is
available from the ncardata FTP area (see below).
Also available in this directory are SPOTFREQ.DOC and CHASE-TV.DOC,
lists of ham radio frequencies and TV stations which carry useful info
for storm chasers, and a few other useful documents.

uriacc.uri.edu [131.128.1.1]
FTP: Change directory to "davet.195" and set transfer type to "binary".
Images of the northeast US in GIF format from the afternoon passes of
NOAA-11. (Provided by Dave Tetreault, DAVET@uriacc.uri.edu.)

unidata.ucar.edu [128.117.140.3]
FTP: Change directory to "images" and set transfer type to "binary".
Weather radar summary map GIFS, surface maps for various places, a few
soundings on skew-t log-p diagrams, GOES Hugo images (in subdirectory
"images/hugo"). Surface maps include Europe and China.

cumulus.met.ed.ac.uk
FTP: Change directory to "images" and set transfer type to "binary".
IR and visibal images of Europe from Meteosat, twice daily, in 1152 x 900
GIF format (size of Sun root window). The subdirectory "gifs" has smaller
3x daily images of the Nordic areas, the UK, and Europe.

marlin.jcu.edu.au [137.219.16.14]
FTP: GMS-4 images updated regularly for various Australian states,
the entire country, and for regions/events of interest such as TOGA/COARE.
The images are in a format designed for the package JCUMetSat but can
be converted to GIF format using the ALCHEMY public domain software
available at this site.

ats.orst.edu [128.193.120.19]
FTP: GOES IR and VIS images over North and Central America, plus a

"floater" image which "could be anything." Also Oregon and US city forecasts.

aurelie.soest.hawaii.edu [128.171.151.121]
FTP: Sea-Surface-Temperature data (near-real-time) in "pub/avhrr/images". AVHRR images within the radius of reception of the university's HRPT station, approximately 5 S to 45 N and 125 W to 165 E. The processed images are available usually within 30 min. of NOAA-11 and NOAA-12 passages. Data are compressed binary in netCDF format (get documentation from unidata.ucar.edu, above) labelled by satellite name (n11/n12) and time. More info available from hrpt@hokulea.soest.hawaii.edu.

=-=
Guillermo Gosset, XE1RGL
Instituto de Biotecnologia/U.N.A.M. email: gosset@132.248.32.1
Cuernavaca, Mexico. xe1rgl@amsat.org
=-=

919. FLASH**Field Day MSG.

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 19:58:01 UTC
From: Edward.Addy@datag.mmbbs.mn.org
Message-ID: <3b3_9406231642@mmbbs.mn.org>
Source record: 27372

NR 01 P 231330Z Jun 94
FM KE0EG NACEC HQ MN
P.O. Box 23057
Minneapolis, MN 55423
612-798-4269
TO ALL NARS MEMBERS, ARES AND RACES STATIONS AND AMATEUR RADIO FIELD
DAY OPERATIONS
GRNC
BT
UNCLAS

Subj: NACEC Exercise 94-1 to be conducted in conjunction with Amateur
Radio National Field Day Exercise and Army MARS exercise
"State Tempest 01-94"

A. Weather Message traffic received from Amateur Radio Field Day
operations will count as NTS message traffic for points.

1. Requesting assistance from all US, Canada & Mexico with heavy day
participation from the following states WI, NE, IA, and SD in
support of this exercise.

2. Exercise times: start 1701Z 25 Jun 94, end 1659Z 26 Jun 94.

3. Frequencies: primary 3.860 Mhz LSB, secondary 1.955 Mhz LSB
Net Call: KE0EG NACEC/X.

4. Mode of operations: LSB voice

5. Essential elements of information are hourly weather
reports needed from participating stations.
Data: temperature, visibility (in miles), cloud cover(in %),
wind speed and direction.

6. Key players in this exercise: U.S. Army Reserve, U.S. Navy Reserve,
North American Amateur Radio Community, North American
Center for Emergency Communications (NACEC), The Salvation Army,
American Red Cross and the Army, Navy and Air Force MARS programs.

a. Emergency HF radio facilities: 2- ANGRS 122 HF-SSB/RTTY trucks.

b. Antenna for Amateur Radio operations: Inverted V at 400 ft
on broadcast tower.

c. NACEC emergency field radio operators provided by:
U.S. Army Reserve, U.S. Navy Reserve, NARS and the local
Amateur radio community.

7. Exercise scenario: A weather front with extremely strong straight-line winds and numerous tornadoes moved thru St Paul metro at approximately 3:45 am followed by torrential rains causing severe flooding. Damage to the cities of Burnsville, Apple Valley, Rosemount, and Farmington was extremely severe.

Early estimates are that over 1500 homes were destroyed and another 3000 received serious damage. Over 150 apartment buildings (2100 units) have been rendered uninhabitable.

Current estimates are that some 45,000 people have been displaced. Death toll currently stands at 215 and the injured count is currently 2500 persons. Counties most affected were Dakota, Hennepin, and Washington. Damage to the Twin Cities metro was moderate, many homes and businesses were damaged and most metro area communications towers were destroyed.

Telephones and cellular telephones [communications] within the 7-county metro area is off line as is electric power.

Most main roads in the south end of the 7-county metro area are closed due to flooding and debris. Both long and short range communications is being maintained by radio.

Communications is being maintained from two emergency communications sites located a half (1/2) mile apart. These sites are located approximately 3 miles south of Rosemount on Highway 3.

Weather Data is being accumulated to assist the National Weather Service in developing long range forcasts for the disaster area.

BT

NNNN

920. Mods for ICW-21AT for use with Sats

Newsgroup: rec.radio.amateur.space
Date: 1994-06-23 20:26:55 UTC
From: etuggle@auc.trw.com
Message-ID: <1994Jun23.202655.18633@auc.trw.com>
Source record: 27371

This may be a dumb question, but I'll ask it anyhow...

Is there a mod to allow me to transmit below 440MHz
(ie. 430 - 440)? I know FM is not used below 440MHz
but AO-21's uplink freq is in that range.

Thanx for any help.

73,
Eddie
KB0LZZ, Parker Colorado

--
Eddie D. Tuggle, etuggle@dora.auc.trw.com | "There is nothing either good or
TRW Denver Operations | bad, but thinking makes it so."
16201 Centretech Pky / Aurora, CO 80011 | -- SHAKESPEARE
Voice: 303.360.4001 FAX: 303.360.4133 |

921. Re: DSP-12 users/programmers

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 01:53:52 UTC
From: fmitch@netcom.com
Message-ID: <fmitchCrvp9s.4tD@netcom.com>
Source record: 27374
Cross-posted to: rec.radio.amateur.digital.misc,rec.radio.amateur.space,rec.radio.scanner

there is a aea dsp-2232 mailing list... you might want to subscribe to it if
you are interested in dsp modems...

mitch
wa4osr

* * * I collect telegraph equipment (mostly bugs - Vibroplex) * * *

Email: fmitchell@rd.qms.com or, second choice, fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR, 11 Midtwon Park, E., Mobile, AL 36606 USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..

--
* * * I collect telegraph equipment (mostly bugs - Vibroplex) * * *

Email: fmitchell@rd.qms.com or, second choice, fmitch@netcom.com
Felton "Mitch" Mitchell, WA4OSR, 11 Midtwon Park, E., Mobile, AL 36606 USA
205-342-7259 home, 205-476-4100 work, 205-476-0465 FAX
co-sysop for W4IAX bbs running fbb ... sysop for WA4OSR DXCluster in Mobile..
---

922. Re(2): unix satelite tracking program

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 06:34:47 UTC
From: mconway@deepthnk.kiwi.gen.nz
Message-ID: <-2129526818.19055512@deepthnk.deepthnk.kiwi.gen.nz>
Source record: 27378

Hi David,

Thanks for the info on the satelite tracking program.

Best Regards,
Mark

-- Mark
_/_/_/ _/_/_/_/ Mark Conway
_/ _/ _/ Deep Thought BBS, Auckland, New Zealand
_/ _/ _/ A FirstClass(tm) Macintosh GUI BBS
_/_/_/ _/ Internet: mconway@deepthnk.kiwi.gen.nz

923. ORBS$175.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 13:49:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-175.o.1994@ampr.org>
Source record: 27386
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-175.O
Orbital Elements 175.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX June 24, 1994
BID: $ORBS-175.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94161.37059705
Element set: 288
Inclination: 27.0950 deg
RA of node: 323.3862 deg
Eccentricity: 0.6022573
Arg of perigee: 185.3079 deg
Mean anomaly: 163.3129 deg
Mean motion: 2.05878627 rev/day
Decay rate: -8.9e-07 rev/day^2
Epoch rev: 8264
Checksum: 320

Satellite: UO-11
Catalog number: 14781
Epoch time: 94173.06474633
Element set: 702
Inclination: 97.7861 deg
RA of node: 187.5613 deg
Eccentricity: 0.0010677
Arg of perigee: 254.9523 deg
Mean anomaly: 105.0499 deg
Mean motion: 14.69223055 rev/day
Decay rate: 1.36e-06 rev/day^2
Epoch rev: 55102
Checksum: 307

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94173.46518979
Element set: 912
Inclination: 82.9241 deg
RA of node: 324.9389 deg
Eccentricity: 0.0012694
Arg of perigee: 16.2450 deg
```

Mean anomaly: 343.9106 deg
Mean motion: 13.72338600 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 35063
Checksum: 305

Satellite: AO-13
Catalog number: 19216
Epoch time: 94166.34337152
Element set: 924
Inclination: 57.7884 deg
RA of node: 247.1622 deg
Eccentricity: 0.7213082
Arg of perigee: 343.7462 deg
Mean anomaly: 2.0006 deg
Mean motion: 2.09724920 rev/day
Decay rate: -4.05e-06 rev/day^2
Epoch rev: 4597
Checksum: 295

Satellite: FO-20
Catalog number: 20480
Epoch time: 94169.92864811
Element set: 698
Inclination: 99.0371 deg
RA of node: 321.4208 deg
Eccentricity: 0.0541031
Arg of perigee: 335.5902 deg
Mean anomaly: 22.0420 deg
Mean motion: 12.83225784 rev/day
Decay rate: -2.6e-07 rev/day^2
Epoch rev: 20435
Checksum: 283

Satellite: AO-21
Catalog number: 21087
Epoch time: 94173.85683540
Element set: 482
Inclination: 82.9437 deg
RA of node: 138.5177 deg
Eccentricity: 0.0037146
Arg of perigee: 68.6256 deg
Mean anomaly: 291.8858 deg
Mean motion: 13.74541420 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 17036
Checksum: 330

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94173.55362644

Element set: 702
Inclination: 82.9198 deg
RA of node: 7.4681 deg
Eccentricity: 0.0030653
Arg of perigee: 92.3538 deg
Mean anomaly: 268.1127 deg
Mean motion: 13.74042547 rev/day
Decay rate: 3.1e-07 rev/day^2
Epoch rev: 16938
Checksum: 311

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94169.23096299
Element set: 263
Inclination: 1.8748 deg
RA of node: 99.1484 deg
Eccentricity: 0.2919067
Arg of perigee: 184.0582 deg
Mean anomaly: 172.2245 deg
Mean motion: 1.42202724 rev/day
Decay rate: -1.11e-06 rev/day^2
Epoch rev: 121
Checksum: 288

/EX

924. ORBS$175.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 13:50:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-175.d.1994@ampr.org>
Source record: 27383
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-175.D
Orbital Elements 175.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX June 24, 1994
BID: $ORBS-175.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94170.25444630
Element set: 3
Inclination: 98.5884 deg
RA of node: 255.0029 deg
Eccentricity: 0.0010695
Arg of perigee: 181.0504 deg
Mean anomaly: 179.0654 deg
Mean motion: 14.29847256 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 22988
Checksum: 305

Satellite: AO-16
Catalog number: 20439
Epoch time: 94174.15857677
Element set: 803
Inclination: 98.5981 deg
RA of node: 260.0929 deg
Eccentricity: 0.0010970
Arg of perigee: 170.1818 deg
Mean anomaly: 189.9580 deg
Mean motion: 14.29901446 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 23045
Checksum: 333

Satellite: DO-17
Catalog number: 20440
Epoch time: 94174.18230054
Element set: 803
Inclination: 98.5989 deg
RA of node: 260.4403 deg
Eccentricity: 0.0011328
Arg of perigee: 169.1131 deg
```

Mean anomaly: 191.0302 deg
Mean motion: 14.30040957 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 23047
Checksum: 264

Satellite: WO-18
Catalog number: 20441
Epoch time: 94170.23945354
Element set: 804
Inclination: 98.5977 deg
RA of node: 256.5458 deg
Eccentricity: 0.0011559
Arg of perigee: 181.6830 deg
Mean anomaly: 178.4313 deg
Mean motion: 14.30014708 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 22991
Checksum: 316

Satellite: LO-19
Catalog number: 20442
Epoch time: 94170.21749238
Element set: 801
Inclination: 98.5981 deg
RA of node: 256.7818 deg
Eccentricity: 0.0011929
Arg of perigee: 181.8684 deg
Mean anomaly: 178.2465 deg
Mean motion: 14.30110837 rev/day
Decay rate: 3.9e-07 rev/day^2
Epoch rev: 22992
Checksum: 331

Satellite: UO-22
Catalog number: 21575
Epoch time: 94170.22487327
Element set: 505
Inclination: 98.4347 deg
RA of node: 244.6813 deg
Eccentricity: 0.0007038
Arg of perigee: 289.9192 deg
Mean anomaly: 70.1229 deg
Mean motion: 14.36919982 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15337
Checksum: 320

Satellite: KO-23
Catalog number: 22077
Epoch time: 94171.73856331

Element set: 400
Inclination: 66.0787 deg
RA of node: 272.5419 deg
Eccentricity: 0.0014492
Arg of perigee: 286.1502 deg
Mean anomaly: 73.7921 deg
Mean motion: 12.86286696 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8724
Checksum: 319

Satellite: AO-27
Catalog number: 22825
Epoch time: 94170.68921790
Element set: 299
Inclination: 98.6530 deg
RA of node: 246.4717 deg
Eccentricity: 0.0008021
Arg of perigee: 198.3357 deg
Mean anomaly: 161.7536 deg
Mean motion: 14.27627002 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 3804
Checksum: 313

Satellite: IO-26
Catalog number: 22826
Epoch time: 94170.24955337
Element set: 299
Inclination: 98.6524 deg
RA of node: 246.0735 deg
Eccentricity: 0.0008442
Arg of perigee: 201.6060 deg
Mean anomaly: 158.4763 deg
Mean motion: 14.27730782 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 3798
Checksum: 317

Satellite: KO-25
Catalog number: 22830
Epoch time: 94170.75009712
Element set: 304
Inclination: 98.5519 deg
RA of node: 243.7911 deg
Eccentricity: 0.0011759
Arg of perigee: 164.8772 deg
Mean anomaly: 195.2762 deg
Mean motion: 14.28057589 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 3806

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Checksum: 321

/EX
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925. ORBS$175.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 13:51:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-175.w.1994@ampr.org>
Source record: 27382
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-175.W
Orbital Elements 175.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX June 24, 1994
BID: $ORBS-175.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94173.97538725
Element set: 849
Inclination: 99.0530 deg
RA of node: 224.5347 deg
Eccentricity: 0.0014389
Arg of perigee: 200.3254 deg
Mean anomaly: 159.7347 deg
Mean motion: 14.13623340 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 49116
Checksum: 314

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94173.98573515
Element set: 747
Inclination: 98.5063 deg
RA of node: 182.8079 deg
Eccentricity: 0.0013117
Arg of perigee: 316.9677 deg
Mean anomaly: 43.0470 deg
Mean motion: 14.24892493 rev/day
Decay rate: 8.8e-07 rev/day^2
Epoch rev: 40343
Checksum: 340

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94174.23616568
Element set: 317
Inclination: 82.5407 deg
RA of node: 263.7696 deg
Eccentricity: 0.0016698
Arg of perigee: 158.3458 deg
```

Mean anomaly: 201.8401 deg
Mean motion: 13.84717546 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 32319
Checksum: 328

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94172.49333875
Element set: 297
Inclination: 82.5371 deg
RA of node: 320.6319 deg
Eccentricity: 0.0015535
Arg of perigee: 252.8136 deg
Mean anomaly: 107.1279 deg
Mean motion: 13.16967801 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28382
Checksum: 315

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94173.94820404
Element set: 669
Inclination: 99.1734 deg
RA of node: 162.9988 deg
Eccentricity: 0.0012451
Arg of perigee: 113.2677 deg
Mean anomaly: 246.9808 deg
Mean motion: 14.12996322 rev/day
Decay rate: 1.05e-06 rev/day^2
Epoch rev: 29603
Checksum: 325

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94170.02906472
Element set: 297
Inclination: 82.5177 deg
RA of node: 142.4515 deg
Eccentricity: 0.0012863
Arg of perigee: 217.9326 deg
Mean anomaly: 142.0931 deg
Mean motion: 13.84366236 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 26794
Checksum: 312

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94173.90736785

Element set: 75
Inclination: 82.5551 deg
RA of node: 266.0200 deg
Eccentricity: 0.0006792
Arg of perigee: 288.6019 deg
Mean anomaly: 71.4328 deg
Mean motion: 13.04419426 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22364
Checksum: 292

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94170.61725050
Element set: 802
Inclination: 82.5465 deg
RA of node: 206.5356 deg
Eccentricity: 0.0016546
Arg of perigee: 134.5444 deg
Mean anomaly: 225.7070 deg
Mean motion: 13.84189241 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 20095
Checksum: 285

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94173.54276226
Element set: 998
Inclination: 98.8349 deg
RA of node: 193.5027 deg
Eccentricity: 0.0016187
Arg of perigee: 357.8182 deg
Mean anomaly: 2.2911 deg
Mean motion: 14.01357183 rev/day
Decay rate: 1.35e-06 rev/day^2
Epoch rev: 19445
Checksum: 327

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94170.91297701
Element set: 810
Inclination: 82.5249 deg
RA of node: 143.8132 deg
Eccentricity: 0.0014961
Arg of perigee: 45.0095 deg
Mean anomaly: 315.2295 deg
Mean motion: 13.83582915 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 18813

Checksum: 298

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94173.49017560
Element set: 709
Inclination: 82.5386 deg
RA of node: 165.8425 deg
Eccentricity: 0.0012975
Arg of perigee: 167.1756 deg
Mean anomaly: 192.9700 deg
Mean motion: 13.16462528 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15205
Checksum: 305

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94173.96212914
Element set: 72
Inclination: 98.6176 deg
RA of node: 201.6115 deg
Eccentricity: 0.0011865
Arg of perigee: 217.8308 deg
Mean anomaly: 142.2030 deg
Mean motion: 14.22419929 rev/day
Decay rate: 1.61e-06 rev/day^2
Epoch rev: 16135
Checksum: 276

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94174.21155417
Element set: 718
Inclination: 82.5520 deg
RA of node: 112.4922 deg
Eccentricity: 0.0012569
Arg of perigee: 176.3427 deg
Mean anomaly: 183.7785 deg
Mean motion: 13.16831335 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13725
Checksum: 298

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94170.53798642
Element set: 310
Inclination: 82.5478 deg
RA of node: 204.5704 deg
Eccentricity: 0.0020878

```
Arg of perigee: 217.2674 deg
Mean anomaly: 142.7032 deg
Mean motion: 13.83008971 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 4041
Checksum: 291

/EX
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926. ORBS$175.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 13:53:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-175.m.1994@ampr.org>
Source record: 27384
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-175.M
Orbital Elements 175.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX June 24, 1994
BID: $ORBS-175.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94170.75531118
Element set: 292
Inclination: 98.6497 deg
RA of node: 246.6007 deg
Eccentricity: 0.0009625
Arg of perigee: 185.5514 deg
Mean anomaly: 174.5560 deg
Mean motion: 14.28030137 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 3806
Checksum: 301

Satellite: MIR
Catalog number: 16609
Epoch time: 94173.46326644
Element set: 649
Inclination: 51.6451 deg
RA of node: 159.9876 deg
Eccentricity: 0.0003094
Arg of perigee: 70.0203 deg
Mean anomaly: 290.1120 deg
Mean motion: 15.56388790 rev/day
Decay rate: 3.227e-05 rev/day^2
Epoch rev: 47686
Checksum: 315

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94173.91026419
Element set: 499
Inclination: 28.4693 deg
RA of node: 199.2219 deg
Eccentricity: 0.0006283
Arg of perigee: 145.3161 deg
```

Mean anomaly: 214.7835 deg
Mean motion: 14.90629917 rev/day
Decay rate: 5.01e-06 rev/day^2
Epoch rev: 3024
Checksum: 300

Satellite: GRO
Catalog number: 21225
Epoch time: 94170.21861132
Element set: 108
Inclination: 28.4614 deg
RA of node: 218.0463 deg
Eccentricity: 0.0003555
Arg of perigee: 230.9886 deg
Mean anomaly: 129.0384 deg
Mean motion: 15.40952200 rev/day
Decay rate: 2.542e-05 rev/day^2
Epoch rev: 5725
Checksum: 264

Satellite: UARS
Catalog number: 21701
Epoch time: 94171.91923479
Element set: 542
Inclination: 56.9839 deg
RA of node: 144.1019 deg
Eccentricity: 0.0005885
Arg of perigee: 101.2249 deg
Mean anomaly: 258.9448 deg
Mean motion: 14.96459021 rev/day
Decay rate: -1.878e-05 rev/day^2
Epoch rev: 15149
Checksum: 327

/EX

927. ORBS$175.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 13:54:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-175.n.1994@ampr.org>
Source record: 27385
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-175.N
2Line Orbital Elements 175.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX June 24, 1994
BID: $ORBS-175.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94161.37059705 -.00000089 00000-0 10000-3 0 2881
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2 14781 97.7861 187.5613 0010677 254.9523 105.0499 14.69223055551021
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2 20480 99.0371 321.4208 0541031 335.5902 22.0420 12.83225784204352
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1 21087U 91006A 94173.85683540 .00000094 00000-0 82657-4 0 4829
2 21087 82.9437 138.5177 0037146 68.6256 291.8858 13.74541420170368
RS-12/13
1 21089U 91007A 94173.55362644 .00000031 00000-0 16208-4 0 7023
2 21089 82.9198 7.4681 0030653 92.3538 268.1127 13.74042547169383
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1 22654U 93031B 94169.23096299 -.00000111 00000-0 00000 0 0 2631
2 22654 1.8748 99.1484 2919067 184.0582 172.2245 1.42202724 1217
UO-14
1 20437U 90005B 94170.25444630 .00000052 00000-0 37351-4 0 35
2 20437 98.5884 255.0029 0010695 181.0504 179.0654 14.29847256229882
AO-16
1 20439U 90005D 94174.15857677 .00000046 00000-0 34734-4 0 8032
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2 20439 98.5981 260.0929 0010970 170.1818 189.9580 14.29901446230455
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1 20440U 90005E 94174.18230054 .00000034 00000-0 29933-4 0 8033
2 20440 98.5989 260.4403 0011328 169.1131 191.0302 14.30040957230471
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1 20441U 90005F 94170.23945354 .00000029 00000-0 28035-4 0 8049
2 20441 98.5977 256.5458 0011559 181.6830 178.4313 14.30014708229919
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1 20442U 90005G 94170.21749238 .00000039 00000-0 32108-4 0 8015
2 20442 98.5981 256.7818 0011929 181.8684 178.2465 14.30110837229924
UO-22
1 21575U 91050B 94170.22487327 .00000051 00000-0 31712-4 0 5058
2 21575 98.4347 244.6813 0007038 289.9192 70.1229 14.36919982153375
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2 22077 66.0787 272.5419 0014492 286.1502 73.7921 12.86286696 87242
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1 22825U 93061C 94170.68921790 .00000043 00000-0 35420-4 0 2999
2 22825 98.6530 246.4717 0008021 198.3357 161.7536 14.27627002 38045
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1 22826U 93061D 94170.24955337 .00000021 00000-0 26498-4 0 2997
2 22826 98.6524 246.0735 0008442 201.6060 158.4763 14.27730782 37988
KO-25
1 22830U 93061H 94170.75009712 .00000045 00000-0 35528-4 0 3042
2 22830 98.5519 243.7911 0011759 164.8772 195.2762 14.28057589 38067
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1 15427U 84123A 94173.97538725 .00000060 00000-0 56103-4 0 8496
2 15427 99.0530 224.5347 0014389 200.3254 159.7347 14.13623340491169
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1 16969U 86073A 94173.98573515 .00000088 00000-0 55675-4 0 7471
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2 19336 82.5371 320.6319 0015535 252.8136 107.1279 13.16967801283822
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1 19531U 88089A 94173.94820404 .00000105 00000-0 81222-4 0 6696
2 19531 99.1734 162.9988 0012451 113.2677 246.9808 14.12996322296033
MET-2/18
1 19851U 89018A 94170.02906472 .00000032 00000-0 15396-4 0 2975
2 19851 82.5177 142.4515 0012863 217.9326 142.0931 13.84366236267948
MET-3/3
1 20305U 89086A 94173.90736785 .00000044 00000-0 10000-3 0 757
2 20305 82.5551 266.0200 0006792 288.6019 71.4328 13.04419426223648
MET-2/19
1 20670U 90057A 94170.61725050 .00000033 00000-0 15760-4 0 8025
2 20670 82.5465 206.5356 0016546 134.5444 225.7070 13.84189241200951
FY-1/2
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1 20788U 90081A 94173.54276226 .00000135 00000-0 11797-3 0 9987
2 20788 98.8349 193.5027 0016187 357.8182 2.2911 14.01357183194453
MET-2/20
1 20826U 90086A 94170.91297701 .00000037 00000-0 20025-4 0 8103
2 20826 82.5249 143.8132 0014961 45.0095 315.2295 13.83582915188139
MET-3/4
1 21232U 91030A 94173.49017560 .00000051 00000-0 10000-3 0 7098
2 21232 82.5386 165.8425 0012975 167.1756 192.9700 13.16462528152051
NOAA-12
1 21263U 91032A 94173.96212914 .00000161 00000-0 91523-4 0 721
2 21263 98.6176 201.6115 0011865 217.8308 142.2030 14.22419929161350
MET-3/5
1 21655U 91056A 94174.21155417 .00000051 00000-0 10000-3 0 7180
2 21655 82.5520 112.4922 0012569 176.3427 183.7785 13.16831335137258
MET-2/21
1 22782U 93055A 94170.53798642 .00000034 00000-0 18094-4 0 3108
2 22782 82.5478 204.5704 0020878 217.2674 142.7032 13.83008971 40411
POSAT
1 22829U 93061G 94170.75531118 .00000055 00000-0 39736-4 0 2922
2 22829 98.6497 246.6007 0009625 185.5514 174.5560 14.28030137 38068
MIR
1 16609U 86017A 94173.46326644 .00003227 00000-0 51700-4 0 6496
2 16609 51.6451 159.9876 0003094 70.0203 290.1120 15.56388790476867
HUBBLE
1 20580U 90037B 94173.91026419 .00000501 00000-0 34737-4 0 4999
2 20580 28.4693 199.2219 0006283 145.3161 214.7835 14.90629917 30249
GRO
1 21225U 91027B 94170.21861132 .00002542 00000-0 53785-4 0 1083
2 21225 28.4614 218.0463 0003555 230.9886 129.0384 15.40952200 57251
UARS
1 21701U 91063B 94171.91923479 -.00001878 00000-0 -14306-3 0 5423
2 21701 56.9839 144.1019 0005885 101.2249 258.9448 14.96459021151499
/EX
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928. Online (Pro) Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 18:26:55 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <2uf8hf$7bk@news.CCIT.Arizona.EDU>
Source record: 27376

Dear Colleague:

Student Space Action would like to inform you of a way in which you can directly voice your support for manned space exploration. As you read this, your space program is in danger of becoming extinct. Congress is once again attempting to eliminate space station funding. Cancellation of the space station could mean the phase-out of space exploration and eventual termination of aerospace industries and job opportunities. The resulting impact on the nation's economy, technology and educational system would be disastrous.

You can tell your congressmen exactly how much you support the space station and the manned space initiative by signing the Student Space Action's Interactive Online Petition. Simply follow these steps:

telnet seds.lpl.arizona.edu
login> space

Now answer the questions to the best of your ability
(read the directions accompanying the petition--
use <tab> to enter answer; <enter> to toggle yes/no;
up/down arrows to go backwards and forwards through
questions. Caution: if floating characters appear on
your screen--ignore--it's probably just an emulation
problem. Your petition will still be signed.

After you submit the petition, you will receive information
on your congressmen and senators so you can contact them further
by phone or mail if you desire.

The petition is also accessible by NCSA Mosaic. Simply go to the following
URL and follow the directions:

URL: http://seds.lpl.arizona.edu/ssa/petition.html

Answer the questions and submit the petition and you
will receive the same information as the telnet version.
You will also have the option of linking to the space
station home page where you can read up-to-date information
on the space station, including issues of "Space Station
This Week."

Please forward this message to anyone you may feel would want to be a part
of this effort--everyone!

If you believe the space program is a vital part of our country's future,
both in economic growth and technological advancement, then sign the

Student Space Action's Interactive Petition.

If you believe that NASA should remain as an engine for continued manned space exploration, then tell everyone you know to sign this petition.

If you believe that our government, by supporting an initiative like the space station, is making an investment in the future generation of this great nation, then send your message to Washington by signing the Student Space Action Interactive Petition.

SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

Student Space Action
ssa@seds.lpl.arizona.edu

929. Re: Online (Pro) Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-06-24 19:26:45 UTC
From: chuck_adams@qmail.ssc.gov
Message-ID: <chuck_adams-240694142629@cadams.ssc.gov>
Source record: 27377

In article <2uf8hf$7bk@news.CCIT.Arizona.EDU>, ssa@SEDS.LPL.Arizona.EDU
(Student Space Action) wrote:
>
>
> Dear Colleague:
>
> Student Space Action would like to inform you of a way in which you can
> directly voice your support for manned space exploration. As you read
> this, your space program is in danger of becoming extinct. Congress is
> once again attempting to eliminate space station funding. Cancellation of
> the space station could mean the phase-out of space exploration and
> eventual termination of aerospace industries and job opportunities. The
> resulting impact on the nation's economy, technology and educational
> system would be disastrous.
>
> You can tell your congressmen exactly how much you support the space
> station and the manned space initiative by signing the Student Space
> Action's Interactive Online Petition. Simply follow these steps:
>
> telnet seds.lpl.arizona.edu
> login> space

> SPACE STATION: IT'S ABOUT LIFE ON EARTH!!
>
> Your voice does count! And it WILL make a difference!
>
> Sincerely,
>
> Student Space Action
> ssa@seds.lpl.arizona.edu

Yeah, well they already got the Super Collider, we predicted last year that
they would come for the Space Station next, and here they are.

Chuck Adams, WB5WRR (The Chuckster)
Not an official document of DOE, SSCL, URA or EG&G
"I cut you three ways, man: quick, deep and frequently"
Internet: chuck_adams@qmail.ssc.gov

930. Work NERDS on Field Day!

Newsgroup: rec.radio.amateur.space
Date: 1994-06-25 01:53:07 UTC
From: penneys@brahms.udel.edu
Message-ID: <2ug2m3$rje@brahms.udel.edu>
Source record: 27379
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc

The Newark Extras from Rural Delaware State, or N.E.R.D.S., will be holding a 5 watt QRP battery power operation on Field Day from Iron Hill Park, New Castle County, Delaware. We will be on HF, packet and satellite.

Not to mention on top of a large magnetic iron mountain under a metal roof during expected thunderstorms.

Please listen for WN3K and try to work us. Thanks.

--
Bob Penneys, WN3K Frankford Radio Club N.E.R.D.S.
Internet: penneys@brahms.udel.edu Mail: 12 E. Mill Stn. Dr., Newark, DE 19711 Work: Ham Radio Outlet (DE) 800-644-4476, 9:30-5:30 Eastern Fax: 302-322-8808

931. Re: DSP-12 users/programmers

Newsgroup: rec.radio.amateur.space
Date: 1994-06-25 02:32:49 UTC
From: chris@zl2tpo.actrix.gen.nz
Message-ID: <66@zl2tpo.actrix.gen.nz>
Source record: 27380
Cross-posted to: rec.radio.amateur.digital.misc,rec.radio.amateur.space,rec.radio.scanner

In article <1994Jun23.024005.14683@penny.cs.fredonia.edu>, John Hansen (hansen@jane.cs.fredonia.edu) writes:
>You may or may not know that LL Grace has a developer's kit for sale for
>$25. I know Brooks has been puzzled as to why there has not been more
>development activity.
The developers kit was more expensive when I purchased it. Also, it doesn't include any modems (except for a test one I think). The only sample code is the V40 code, not DSP code.

Chris ZL2TPO

932. help-which radio?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-25 03:52:48 UTC
From: whitestone@ins.infonet.net
Message-ID: <2ug9mg$c9i@insosf1.infonet.net>
Source record: 27381

I am planning to build a amateur satellite station. I am considering the Yaseau 736 R or the ICOM 970A. Has anyone had experience with either or both of these radios that you could pass along to me. I would appreicate it ... Please e mail me with any informaion ...

a

933. Two-Line Orbital Element Sets (TLE420)

Newsgroup: rec.radio.amateur.space
Date: 1994-06-25 14:28:04 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.772554484@afit.af.mil>
Source record: 27387

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #420 -
Alouette 1
1 00424U 62049 94172.29689696 .00000071 00000-0 72294-4 0 42
2 00424 80.4644 280.9450 0024430 103.6693 256.7174 13.67812994582969
ATS 1
1 02608U 66110A 94171.57741181 -.00000305 00000-0 10000-3 0 8808
2 02608 14.5571 0.3776 0010408 45.1010 0.9653 1.00377270 17501
ATS 3
1 03029U 67111A 94173.54667154 -.00000129 00000-0 10000-3 0 2105
2 03029 14.6551 7.4152 0009034 265.1802 89.4432 1.00273207 97487
Cosmos 398
1 04966U 71016A 94174.77121834 .00125474 72763-5 23914-3 0 3021
2 04966 51.4465 304.1248 1021244 23.5681 340.9203 13.89789728773665
Starlette
1 07646U 75010A 94172.92309401 -.00000122 00000-0 16612-4 0 7913
2 07646 49.8245 134.6631 0205869 351.9290 7.8315 13.82186984978503
LAGEOS
1 08820U 76039A 94172.49000315 -.00000004 00000-0 10000-3 0 55
2 08820 109.8215 137.0716 0044291 284.1767 75.3814 6.38664318167429
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94173.68960946 .00000061 00000-0 00000+0 0 3558
2 10061 11.2116 45.6410 0001806 4.3934 332.4655 1.00269354 7162
IUE
1 10637U 78012A 94172.36441199 -.00000274 00000-0 10000-3 0 118
2 10637 34.5869 94.7592 1315597 36.1006 220.6144 1.00266738 12765
GPS BI-01
1 10684U 78020A 94170.76003427 -.00000040 00000-0 10000-3 0 2763
2 10684 64.6441 45.4402 0062268 163.1219 197.1467 1.98069596104982
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GPS BI-02
1 10893U 78047A 94174.20500907 -.00000047 00000-0 10000-3 0 767
2 10893 63.5380 284.2507 0214382 13.9724 346.5963 2.01627278118193
GOES 3
1 10953U 78062A 94171.10064821 .00000063 00000-0 10000-3 0 3228
2 10953 10.1336 48.3721 0006089 51.2491 31.2883 1.00240735 11755
SeaSat 1
1 10967U 78064A 94172.57162227 -.00000022 00000-0 37456-4 0 2990
2 10967 107.9985 111.2887 0002639 261.5964 98.4878 14.37961971836992
GPS BI-03
1 11054U 78093A 94173.41502352 -.00000048 00000-0 10000-3 0 1915
2 11054 63.2222 281.5939 0044244 176.1913 183.8567 1.93505238114610
Nimbus 7
1 11080U 78098A 94172.72235274 -.00000081 00000-0 -34948-4 0 4041
2 11080 99.0538 56.1866 0009419 116.3700 243.8420 13.83731135790700
GPS BI-04
1 11141U 78112A 94173.02701135 -.00000034 00000-0 00000+0 0 8907
2 11141 64.6493 46.6071 0048727 25.8030 334.5056 1.92894913 3872
GPS BI-05
1 11690U 80011A 94172.89804879 -.00000032 00000-0 10000-3 0 8004
2 11690 64.9975 47.1546 0141748 196.9480 162.6021 2.00555835119639
GPS BI-06
1 11783U 80032A 94171.43666339 -.00000048 00000-0 10000-3 0 9813
2 11783 62.6501 278.1166 0210771 29.2648 331.9202 2.03456620104027
GOES 5
1 12472U 81049A 94171.60438444 .00000041 00000-0 10000-3 0 7732
2 12472 6.8313 57.9686 0006782 14.3514 283.7533 1.00320932 5793
Cosmos 1383
1 13301U 82066A 94171.83419026 .00000037 00000-0 26161-4 0 3023
2 13301 82.9287 307.0768 0029036 83.4348 277.0109 13.68056594597922
LandSat 4
1 13367U 82072A 94174.24218174 .00000068 00000-0 25083-4 0 5018
2 13367 98.1799 232.6751 0005999 233.5710 126.4935 14.57130816634946
IRAS
1 13777U 83004A 94174.56533224 -.00000253 00000-0 -14423-3 0 6283
2 13777 98.9726 5.3878 0013017 300.8401 59.1480 13.99206001252037
Cosmos 1447
1 13916U 83021A 94172.56319647 .00000021 00000-0 64922-5 0 4039
2 13916 82.9440 8.4623 0039235 18.6827 341.5749 13.74311851563939
TDRS 1
1 13969U 83026B 94171.00000000 -.00000201 00000-0 10000-4 0 3105
2 13969 7.7221 50.9708 0007424 67.8279 234.1079 1.00280596 14084
GOES 6
1 14050U 83041A 94171.40590671 -.00000033 00000-0 10000-3 0 2242
2 14050 5.6308 61.0916 0003623 342.3290 256.3175 1.00219743 12812
OSCAR 10
1 14129U 83058B 94161.37059705 -.00000089 00000-0 10000-3 0 2881
2 14129 27.0950 323.3862 6022573 185.3079 163.3129 2.05878627 54679
LandSat 5
1 14780U 84021A 94174.14254958 .00000067 00000-0 24839-4 0 891
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2 14780 98.1636 233.7896 0003634 239.9334 120.1504 14.57137268548343
UoSat 2
1 14781U 84021B 94173.06474633 .00000136 00000-0 30919-4 0 7021
2 14781 97.7861 187.5613 0010677 254.9523 105.0499 14.69223055551021
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94172.22366698 .00000042 00000-0 29112-4 0 6027
2 15055 82.9564 62.0777 0026277 203.0082 156.9897 13.73607319501180
GPS BI-10
1 15271U 84097A 94174.62696617 -.00000037 00000-0 10000-3 0 8143
2 15271 62.3516 278.0800 0145627 349.3390 10.3817 2.00581022 70739
Cosmos 1602
1 15331U 84105A 94173.16063610 .00000348 00000-0 38413-4 0 2944
2 15331 82.5339 73.0731 0019406 182.0635 178.0506 14.84420237525252
NOAA 9
1 15427U 84123A 94175.10785954 .00000068 00000-0 60517-4 0 8505
2 15427 99.0529 225.6808 0014455 197.2327 162.8358 14.13623661491321
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94174.87585856 .00002138 00000-0 36569-4 0 6513
2 16609 51.6452 152.9234 0003192 70.6320 289.5015 15.56393216477083
SPOT 1
1 16613U 86019A 94172.29775912 .00000089 00000-0 62356-4 0 6907
2 16613 98.6888 245.8605 0000829 68.6236 291.5027 14.20052630117149
Cosmos 1766
1 16881U 86055A 94174.90431600 .00000361 00000-0 41012-4 0 2104
2 16881 82.5187 129.4398 0018030 200.7047 159.3425 14.83449831426450
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1 16908U 86061A 94173.86043516 -.00000097 00000-0 00000+0 0 8997
2 16908 50.0103 66.9549 0011356 328.2629 31.7521 12.44410088 26090
NOAA 10
1 16969U 86073A 94175.03904441 .00000101 00000-0 61526-4 0 7484
2 16969 98.5069 183.8295 0013111 313.9897 46.0201 14.24892897403580
MOS-1
1 17527U 87018A 94173.22031193 .00000091 00000-0 99794-4 0 860
2 17527 99.0315 241.8046 0000721 29.5754 330.5448 13.94908874373641
GOES 7
1 17561U 87022A 94171.40956132 -.00000050 00000-0 10000-3 0 8866
2 17561 1.5539 75.7363 0004708 344.3817 243.4593 1.00267108 10001
Kvant-1
1 17845U 87030A 94174.81163661 .00013031 00000-0 18758-3 0 8898
2 17845 51.6453 153.2455 0003181 81.5565 278.5081 15.56401882477143
DMSP B5D2-3
1 18123U 87053A 94175.08041132 .00000029 00000-0 37182-4 0 5300
2 18123 98.7865 6.6822 0014065 157.0154 203.1649 14.15362005361982
RS-10/11
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1 18129U 87054A 94174.85046413 .00000047 00000-0 34888-4 0 9133
2 18129 82.9240 323.9147 0012654 12.6103 347.5370 13.72338760350825
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1 18312U 87068A 94174.59223614 .00000036 00000-0 19192-4 0 3002
2 18312 82.5530 206.7740 0014065 92.5380 267.7390 13.84032564345944
Meteor 2-17
1 18820U 88005A 94175.24777418 .00000050 00000-0 30980-4 0 3180
2 18820 82.5408 262.9651 0016795 155.4818 204.7134 13.84717525323337
DMSP B5D2-4
1 18822U 88006A 94175.09426208 .00000041 00000-0 36822-4 0 6380
2 18822 98.4406 29.7762 0006399 334.5971 25.4889 14.22956234331502
Glonass 34
1 19163U 88043A 94169.82771112 .00000011 00000-0 10000-3 0 8996
2 19163 65.0367 110.3926 0007358 163.3530 196.6515 2.13102286 46698
Glonass 36
1 19165U 88043C 94174.10685588 -.00000016 00000-0 10000-3 0 2941
2 19165 65.0130 110.2088 0003266 323.4186 36.5319 2.13102235 47404
METEOSAT 3
1 19215U 88051A 94174.32355517 -.00000268 00000-0 10000-3 0 9289
2 19215 1.7450 72.2636 0001653 56.9927 184.2179 1.00266107 9976
AO-13
1 19216U 88051B 94166.34337152 -.00000405 00000-0 10000-4 0 9248
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2 19274 82.5120 229.6416 0019911 355.2042 4.8978 14.82188026322031
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2 19548 1.0243 77.5977 0003227 105.0081 117.8482 0.99823985 8260
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2 19749 64.9848 109.9750 0006767 256.7086 103.1937 2.13101452 42304
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2 22827 98.6476 247.4774 0008848 182.7910 177.3210 14.27841962 38190
PO-28
1 22829U 93061G 94170.75531118 .00000055 00000-0 39736-4 0 2922
2 22829 98.6497 246.6007 0009625 185.5514 174.5560 14.28030137 38068
KO-25
1 22830U 93061H 94175.16420620 .00000038 00000-0 32645-4 0 3057
2 22830 98.5521 248.1146 0011841 152.0080 208.1742 14.28058196 38698
GPS BIIA-23
1 22877U 93068A 94169.75961012 -.00000046 00000-0 10000-3 0 1304
2 22877 55.2075 78.3771 0032305 292.0541 67.6146 2.00577004 4763
METEOSAT 6
1 22912U 93073B 94174.29520146 -.00000092 00000-0 00000+0 0 994
2 22912 0.8789 267.5099 0001779 244.2979 215.9783 1.00274308 593
HST Array
1 22920U 90037C 94173.39655796 .00005148 00000-0 42402-3 0 1577
2 22920 28.4708 192.8253 0003358 307.7989 52.2292 14.96951492 30272
Soyuz TM-18
1 22957U 94001A 94174.81163661 .00013031 00000-0 18758-3 0 1572
2 22957 51.6453 153.2455 0003181 81.5565 278.5081 15.56401882 25995
Meteor 3-6
1 22969U 94003A 94173.70852487 .00000051 00000-0 10000-3 0 732
```

```
2 22969 82.5591 52.3640 0014150 254.2100 105.7461 13.16722829 19572
TUBSAT-B
1 22970U 94003B 94174.15293916 .00000051 00000-0 10000-3 0 639
2 22970 82.5601 52.0328 0014395 250.0057 109.9520 13.16821892 19631
ODERACS A
1 22990U 94006B 94174.47678211 .00062218 11836-4 20179-3 0 1077
2 22990 56.9818 297.6525 0012676 158.0594 202.1072 15.91048874 21173
ODERACS B
1 22991U 94006C 94174.51360546 .00059893 11712-4 19946-3 0 1014
2 22991 56.9791 297.8693 0013459 158.5533 201.4793 15.90552105 21178
ODERACS E
1 22994U 94006F 94173.35291564 .00031440 00000-0 15656-3 0 847
2 22994 56.9843 306.9910 0014922 155.1669 205.0122 15.81565353 20930
ODERACS F
1 22995U 94006G 94174.80572672 .00023704 00000-0 11798-3 0 1074
2 22995 56.9870 300.3558 0014588 157.3006 202.8693 15.81754455 21161
BREMSAT
1 22998U 94006H 94174.76234301 .00023011 00000-0 11906-3 0 909
2 22998 56.9902 301.4805 0011588 161.8857 198.2580 15.80987544 20997
GPS BIIA-24
1 23027U 94016A 94174.82365848 -.00000075 00000-0 00000+0 0 615
2 23027 54.9723 19.2143 0061489 190.8368 169.0754 2.00558954 2179
Glonass 62
1 23043U 94021A 94164.21533765 -.00000033 00000-0 00000+0 0 586
2 23043 64.8154 349.5088 0005775 174.1561 185.8730 2.13103161 1346
Glonass 63
1 23044U 94021B 94164.09824796 -.00000033 00000-0 00000+0 0 399
2 23044 64.8050 349.5160 0028327 200.9212 158.9838 2.13103228 1346
Glonass 64?
1 23045U 94021C 94173.59859724 -.00000058 00000-0 00000+0 0 447
2 23045 64.7856 349.1985 0000945 291.8985 68.0587 2.12875431 1548
GOES 8
1 23051U 94022A 94173.47944402 -.00000194 00000-0 00000+0 0 1150
2 23051 0.4348 265.1502 0001609 258.9672 189.3982 1.00262187 342
ProgressM23
1 23114U 94031A 94174.81163661 .00013031 00000-0 18758-3 0 345
2 23114 51.6453 153.2455 0003181 81.5565 278.5081 15.56401882 5090
1994030E
1 23116U 94030E 94173.12318574 .00002110 00000-0 61839-3 0 89
2 23116 47.3052 267.5378 7239905 8.8780 358.9747 2.33496211 802
1994030F
1 23117U 94030F 94172.32415581 .00000040 00000-0 14928-3 0 118
2 23117 47.3540 267.8712 7218663 8.5543 359.1923 2.33020503 785
1993073E
1 23118U 93 73 E 94150.37883330 -.00000275 00000-0 00000+0 0 19
2 23118 0.9865 270.2950 0065470 338.4488 280.8293 0.99998024 439
Cosmos 2281
1 23119U 94032A 94174.90134406 .00019471 -10816-5 32236-4 0 384
2 23119 82.5829 14.1263 0065270 78.3209 282.5383 15.98555791 2668
1994032C
```

```
1 23121U 94 32 C 94169.00070756 .90059409 -62469-5 13805-2 0 79
2 23121 82.4527 20.5404 0012786 58.5489 301.7064 16.52752255 1739
FOTON 9
1 23122U 94033A 94174.87756028 .00057099 80158-5 87949-4 0 132
2 23122 62.8124 58.0623 0102150 110.4458 250.7670 15.95046248 1474
1994033B
1 23123U 94033B 94175.16736711 .00376490 81527-5 45457-3 0 297
2 23123 62.7981 56.7511 0073705 104.6986 256.2341 16.02328195 1525
Intelsat7F2
1 23124U 94034A 94173.48173411 -.00000113 00000-0 00000+0 0 216
2 23124 0.9850 184.5570 1999151 180.7856 356.5132 1.31970435 60
STRV-1A
1 23125U 94034B 94172.04179949 .00001078 00000-0 43613-3 0 109
2 23125 7.0352 184.1504 7275689 181.0794 175.2721 2.27287304 98
STRV-1B
1 23126U 94034C 94169.85385314 -.00000132 00000-0 -15778-3 0 91
2 23126 7.0379 184.9961 7279041 179.3671 182.8001 2.26879270 41
1994034D
1 23127U 94034D 94172.60849069 -.00000017 00000-0 10000-4 0 85
2 23127 7.0625 184.0856 7259192 181.6272 173.3741 2.20411966 109
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

934. ARLK025 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-06-25 18:50:16 UTC
From: w1aw@arrl.org
Message-ID: <$arlk025.1994@ampr.org>
Source record: 27388
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK025
ARLK025 Keplerian data

ZCZC SK92
QST de W1AW
Keplerian Bulletin 25 ARLK025
From ARRL Headquarters
Newington, CT June 24, 1994
To all radio amateurs

SB KEP ARL ARLK025
ARLK025 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94189.72594477 .00027158 30948-8 84442-4 0 19
2 99965 28.4683 7.4627 0003452 327.1219 272.8160 15.90322967 17
AO-10
1 14129U 83058B 94161.37059705 -.00000089 00000-0 10000-3 0 2881
2 14129 27.0950 323.3862 6022573 185.3079 163.3129 2.05878627 54679
RS-10/11
1 18129U 87054A 94174.85046413 .00000047 00000-0 34888-4 0 9133
2 18129 82.9240 323.9147 0012654 12.6103 347.5370 13.72338760350825
UO-11
1 14781U 84021B 94173.06474633 .00000136 00000-0 30919-4 0 7021
2 14781 97.7861 187.5613 0010677 254.9523 105.0499 14.69223055551021
RS-12/13
1 21089U 91007A 94173.55362644 .00000031 00000-0 16208-4 0 7023
2 21089 82.9198 7.4681 0030653 92.3538 268.1127 13.74042547169383
AO-13
1 19216U 88051B 94166.34337152 -.00000405 00000-0 10000-4 0 9248
2 19216 57.7884 247.1622 7213082 343.7462 2.0006 2.09724920 14475
UO-14
1 20437U 90005B 94174.73301052 .00000006 00000-0 19183-4 0 45
2 20437 98.5876 259.4189 0011013 167.7590 192.3848 14.29847418230525
AO-16
1 20439U 90005D 94174.15857677 .00000046 00000-0 34734-4 0 8032
2 20439 98.5981 260.0929 0010970 170.1818 189.9580 14.29901446230455
```

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DO-17
1 20440U 90005E 94174.18230054 .00000034 00000-0 29933-4 0 8033
2 20440 98.5989 260.4403 0011328 169.1131 191.0302 14.30040957230471
WO-18
1 20441U 90005F 94174.78746195 .00000008 00000-0 20194-4 0 8051
2 20441 98.5963 261.0371 0011860 168.0147 192.1319 14.30015181230562
LO-19
1 20442U 90005G 94174.27544238 .00000027 00000-0 27276-4 0 8026
2 20442 98.5986 260.7912 0012158 169.4175 190.7263 14.30111335230506
FO-20
1 20480U 90013C 94174.84033689 .00000215 00000-0 56251-3 0 6990
2 20480 99.0358 325.4045 0540431 324.4630 32.1571 12.83227785204989
AO-21
1 21087U 91006A 94173.85683540 .00000094 00000-0 82657-4 0 4829
2 21087 82.9437 138.5177 0037146 68.6256 291.8858 13.74541420170368
UO-22
1 21575U 91050B 94174.75104825 .00000034 00000-0 26148-4 0 5068
2 21575 98.4345 249.1158 0006807 273.6854 86.3552 14.36920502154024
KO-23
1 22077U 92052B 94171.73856331 -.00000037 00000-0 10000-3 0 4006
2 22077 66.0787 272.5419 0014492 286.1502 73.7921 12.86286696 87242
KO-25
1 22830U 93061H 94175.16420620 .00000038 00000-0 32645-4 0 3057
2 22830 98.5521 248.1146 0011841 152.0080 208.1742 14.28058196 38698
IO-26
1 22826U 93061D 94174.73474406 .00000031 00000-0 30351-4 0 3005
2 22826 98.6520 250.5132 0008556 187.5519 172.5529 14.27731503 38623
AO-27
1 22825U 93061C 94175.24482164 .00000016 00000-0 24226-4 0 3008
2 22825 98.6527 250.9813 0008173 183.6615 176.4505 14.27627356 38692
PO-28
1 22829U 93061G 94175.23956427 .00000021 00000-0 26210-4 0 2931
2 22829 98.6496 251.0411 0009789 171.7387 188.3953 14.28030574 38707
Mir
1 16609U 86017A 94174.87585856 .00002138 00000-0 36569-4 0 6513
2 16609 51.6452 152.9234 0003192 70.6320 289.5015 15.56393216477083

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
June 28, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

935. Ham Sats

Newsgroup: rec.radio.amateur.space
Date: 1994-06-26 10:04:00 UTC
From: eddy.salvador@cjbbs.com
Message-ID: <4d5_9406261630@cjbbs.com>
Source record: 27390

I'm new into satellite tracking but I have been a ham for some time now.
can anyone tell me what would be a good bird to track, its beacon freq,
time and modes of op and whatever if it can be received with standard
equipment.
Thanks

936. reader

Newsgroup: rec.radio.amateur.space
Date: 1994-06-26 22:23:34 UTC
From: pat.curtis@springsboard.org
Message-ID: <940626160719844@springsboard.org>
Source record: 27389

hi alex, i am having some
trouble with my off line reader. it works fine on other bbs and worked
fine here before the big crash of 6-94. HELP!

937. ANS-176 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 02:07:01 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-176.01.1994@ampr.org>
Source record: 27391
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-176.01
PHASE 3-D STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 176.01 FROM AMSAT HQ
SILVER SPRING, MD JUNE 25, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-176.01

WD4FAB & DB2OS Provide Phase 3-D Status Report

The Phase 3-D Project Leader and AMSAT-DL President, Karl Meinzer (DJ4ZC) hosted six days of meetings, 13-18 June 1994 in Marburg, Germany to assess the status of a number of major areas of the project. In attendance at these meetings was Dick Jansson (WD4FAB), AMSAT-NA's Vice-President of Engineering. As a result of these meetings, the Project has ordered the solar arrays and is on the verge of ordering the spacecraft batteries. The selection of the machining contractor for the large aluminum rings for the 2624mm diameter SBS (Spacecraft Bus System) was also discussed and is quite close to being ordered. The SBS, which will be fabricated at Weber State University (WSU) in Ogden, UT, is a large cylinder that is part of the load carrying structure of the Ariane-5 launch vehicle. The Phase 3-D spacecraft is housed inside of the SBS for the ride into orbit.

Discussions were also held with Danny Orban (ON4AOD) on design refinements of the Ku Band transmitter (24 GHz) being constructed in Belgium. Some of these Ku Band transmitter refinements may also be applied to the X Band transmitter being constructed by the AMSAT-OH group at the Helsinki University of Technology in Finland.

One day of the meetings was devoted to very detailed discussions with Bernard LaCoste of the European Space Agency (ESA) regarding the launch configuration of the AR-502 vehicle and the testing that AMSAT will need to do inorder to qualify the Phase 3-D spacecraft and the SBS for their launch on AR-502.

Within the next month, AMSAT will conclude the ordering of the major components noted above. Also, in this near time period, the "flight" spaceframe will arrive at the Florida integration facility and start its final cleaning, paiting and assembly. The integration facility, located at the Orland Internation Airport, is in the final stages of being prepared for its mission of providing the specialized environ-ment for the spacecraft assembly activities.

[The AMSAT News Service (ANS) would like to thank WD4FAB and DB2OS for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-176.02
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 176.02 FROM AMSAT HQ
SILVER SPRING, MD JUNE 25, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-176.02

Weekly OSCAR Status Reports: 18-JUN-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

KO-25: The uplink of the KO-25 spacecraft has been recently switched to
145.870 MHz. In addition, the control station is indicating that a
reset of the On-Board Computer (OBS) is planned for 20-June-94.
[K6OYY]

DO-17: DO-17 still continues to transmit its voice message on a downlink
frequency of 145.825 MHz.

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly
OSCAR status reports. If you have a favorite OSCAR which you work on a
regular basis and would like to contribute to this bulletin, please send
your observations to WD0HHU at his CompuServe address of 70524,2272, on
INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO
area, WD0HHU @ W0GVT. Also, if you find that the current set of orbital
elements are not generating the correct AOS/LOS times at your QTH, PLEASE
INCLUDE THAT INFORMATION AS WELL. The information you provide will be of
value to all OSCAR enthusiasts.

/EX

938. Re: Ham Sats

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 03:48:12 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Jun27.034812.903@gov.nt.ca>
Source record: 27392

In article <4d5_9406261630@cjbbs.com> eddy.salvador@cjbbs.com (Eddy Salvador) writes:
>
>
>
>I'm new into satellite tracking but I have been a ham for some time now.
>can anyone tell me what would be a good bird to track, its beacon freq,
>time and modes of op and whatever if it can be received with standard
>equipment.
> Thanks

There are several good one to get started on. Here are few easy
ones you can try for:

DO-17 145.825 MHz FM voice and AX.25 1200 baud packet telemetry
AO-21 145.987 MHz FM voice repeater and AX.25 1200 baud telemetry
AO-27 436.800 MHz FM voice repeater
Mir 145.550 MHz FM voice and AX.25 1200 baud packet BBS

All of the above should provide good results with an outside antenna
or from a mobile setup. Note that the frequencies listed will shift
from slightly higher to slightly lower than shown as the satellite
passes over due to the Doppler effect.
Good Luck!
73
John - VE8EV
==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

939. APT-Satellites: Report JUNE 26, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 07:05:15 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-270694070542@129.26.163.235>
Source record: 27393
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, JUNE 26, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 On
Meteor 3-5: APT 137.85 On

Nothing unusual. Meteor 2-21 passes early in the morning,
APT-signal remains weak. Meteor 3-5 is ok. NOAA-9 became
a late-morning descender transmitting good illuminated
images. NOAA-11 slowly moves to later afternoon. Good
transmissions from NOAA-10 and NOAA-12.
```


```
+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

940. decoding telemetry by telephone modem ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 13:51:31 UTC
From: juergen.putzger@physik.uni-regensburg.de
Message-ID: <juergen.putzger.16.0@physik.uni-regensburg.de>
Source record: 27394

Hi,

I would like to decode the telemetry of DOVE-OSCAR17. Is it possible to do this with an ordinary telephone modem (Hayes compatible, max. 2400 Baud) ? The transmission rate is 1200 Baud AFSK (like packet radio). A circuit will be needed to simulate the telephone line, i suppose a DC-source in series with a transformer would do the job. Has anyone tried this with success?

Juergen Putzger (juergen.putzger@physik.uni-regensburg.de)

941. Newbie Experience with DOVE Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 15:44:29 UTC
From: philr@radian.com
Message-ID: <1994Jun27.154429.3566@radian.uucp>
Source record: 27395
Cross-posted to: alt.radio.scanner,rec.radio.amateur.space

Newbie Experience with DOVE Satellite

I finally decided to see if I could "catch" my first satellite last week. Since DOVE is supposed to be so easy to hear, I decided that it would be my target. Everything you've heard about it is TRUE. I fired up a tracking program, determined when the next pass would be, and then turned on my ICOM handi-talkie. Right on schedule, there it was saying, "HI, THIS IS DOVE IN SPACE." Would could be easier? I thought I'd share my experience with the net just in case there are any others out there who have been wanting to try and hear a satellite first hand, but haven't ever gotten around to it.

There are plenty of other sources that describe the satellite itself in detail. Let me just say here that the frequency you are interested in is 145.825 MHz. The channel alternates between standard packet and digitized voice. The packet sessions are transmit-only (you cannot connect to the satellite) and last for 3 minutes and 10 seconds. I have included what I received during one of the transmissions at the end of this message so you can see what it looks like (anyone know how to decode the telemetry information?). After 3 minutes and 10 seconds of packet traffic, the digitized voice switches on. The voice is male and sounds pretty artificial. It says, "Hi, this is DOVE in space." It repeats this phrase 9 times, for a total of 66 seconds. It then switches back to packet and starts all over again. (I understand that this sequence is highly subject to change, but this is how it has been working for the past several days.)

The signal is quite strong. In fact, on close passes, I was able to copy the signal clearly using nothing more than a Bearcat 200XLT scanner with the stock rubber duck antenna. Using a discone antenna *inside* my attic, my ICOM 02AT was able to receive the satellite at less than 5 deg elevation and it broke the squelch at 25 deg elevation. On passes above about 40 deg elevation, it broke the squelch on a Bearcat 200XLT with a duck. I found that leaving the squelch open (off) resulted in much more copy time. (Just turn down the volume a little so the static doesn't drive you nuts!)

There isn't much Doppler shift to worry about. In fact, you could just set your radio to 145.825 and not worry about it. But, if you want to squeeze every last little peep out of a pass, I found that starting the radio on 145.830, then switching to 145.825 after about one-third of the pass, then switching to 145.820 for the last third of the pass, extended the copy time a little.

I found that generally speaking, you can copy three passes in a block. Usually the first pass is pretty low on the horizon, the second pass is a pretty good one (close to overhead), and then the third one is a pretty low pass again. I was listening to passes around noon local time as the satellite was traveling from north to south. The first pass was to the east, then overhead, and then to the west. The passes are about 90 minutes apart and an overhead pass lasts about 15 minutes.

All you need to copy the packet transmissions is a standard VHF TNC. Just remember that you do not connect to the satellite, so you need to make sure that you have your software set to monitor *all* packets the TNC receives. For those of you who don't have a amateur radio license (why not?!) and don't know what packet radio sounds like, scan between 145.010 and 145.100 MHz. That bleeeeep sound is what you are listening for from the satellite.

Get a copy of any of the satellite tracking programs and a copy of the latest elements. I used the 2-line NASA format elements that TS Kelso posts to rec.radio.amateur.misc (thanks, Dr. Kelso!). The satellite you are interested in is identified as DO-17. Determine the time of the next pass with an elevation of around 40 deg or more (for your first try), and turn on your radio. Alternatively, if you don't have access to a tracking program, you can just set your radio to 145.825 MHz with the squelch on, and wait for a pass. That's all there is to it!

Phil, KA5PVH
philr@radian.com

XOXOXOX BEGIN DOVE PACKET SESSION XOXOXOX

17-Jun-94 13:04:02 SWITCH*>SWITCH <DM>
17-Jun-94 13:04:53 SWITCH*>SWITCH <DM>
17-Jun-94 13:05:30 DOVE-1*>BCRXMT <UI>:
vmax=769249 battop=766771 temp=-118087
17-Jun-94 13:05:30 DOVE-1*>LSTAT <UI>:
I P:0x1553 o:0 l:6734 f:6947, d:0 st:0
17-Jun-94 13:05:30 SWITCH*>SWITCH <DM>
17-Jun-94 13:05:53 DOVE-1*>TIME-1 <UI>:
PHT: uptime is 007/04:05:20. Time is Fri Jun 17 18:05:00 1994

17-Jun-94 13:05:53 SWITCH*>SWITCH <DM>
17-Jun-94 13:05:57 DOVE-1*>TLM <UI>:
00:57 01:58 02:86 03:34 04:59 05:58 06:6C 07:56 08:70 09:72 0A:A2

```
0B:F5 0C:E8 0D:DA 0E:50 0F:25 10:E4 11:AC 12:00 13:D6 14:98 15:B1
16:6C 17:65 18:66 19:5F 1A:66 1B:00 1C:70 1D:68 1E:CA 1F:66 20:D6
17-Jun-94 13:05:58 DOVE-1*>TLM <UI>:
21:D3 22:84 23:18 24:16 25:26 26:1E 27:02 28:02 29:1A 2A:06 2B:58
2C:00 2D:64 2E:54 2F:A9 30:D6 31:AA 32:00 33:00 34:B0 35:A4 36:A8
37:AA 38:83
17-Jun-94 13:05:59 DOVE-1*>LSTAT <UI>:
I P:0x1553 o:0 l:6734 f:6947, d:0 st:0
17-Jun-94 13:05:59 SWITCH*>SWITCH <DM>
17-Jun-94 13:06:23 DOVE-1*>TIME-1 <UI>:
PHT: uptime is 007/04:05:50. Time is Fri Jun 17 18:05:30 1994

17-Jun-94 13:06:23 SWITCH*>SWITCH <DM>
17-Jun-94 13:06:27 DOVE-1*>TLM <UI>:
00:59 01:59 02:86 03:34 04:58 05:5A 06:70 07:56 08:6D 09:71 0A:A2
0B:F4 0C:E8 0D:DB 0E:38 0F:25 10:E4 11:AC 12:00 13:D9 14:98 15:B0
16:6C 17:63 18:65 19:64 1A:63 1B:01 1C:6C 1D:6C 1E:D0 1F:67 20:D6
17-Jun-94 13:06:28 DOVE-1*>TLM <UI>:
21:D3 22:84 23:1B 24:17 25:29 26:45 27:06 28:01 29:1D 2A:02 2B:50
2C:01 2D:7C 2E:5D 2F:AA 30:DA 31:A9 32:00 33:01 34:B1 35:A4 36:A9
37:A6 38:82
17-Jun-94 13:06:28 DOVE-1*>STATUS <UI>:
80 00 00 91 01 18 EE 02 00 90 00 01 0D 0F 3C 05 0F 00 00 00 00
17-Jun-94 13:06:29 DOVE-1*>BRAMST <UI>:
0500 utc 14 June 1994

Voice Module now active
Software testing continues
S-Band transmitter is off

73 DOVE Command Team (WJ9F)
17-Jun-94 13:06:30 DOVE-1*>BCRXMT <UI>:
vmax=769249 battop=766771 temp=-118087
17-Jun-94 13:06:30 DOVE-1*>LSTAT <UI>:
I P:0x1553 o:0 l:6734 f:6947, d:0 st:0
17-Jun-94 13:06:30 SWITCH*>SWITCH <DM>
17-Jun-94 13:06:53 DOVE-1*>TIME-1 <UI>:
PHT: uptime is 007/04:06:20. Time is Fri Jun 17 18:06:00 1994

17-Jun-94 13:06:53 SWITCH*>SWITCH <DM>
17-Jun-94 13:06:58 DOVE-1*>TLM <UI>:
21:D4 22:84 23:1E 24:17 25:26 26:64 27:09 28:01 29:1E 2A:02 2B:44
2C:00 2D:86 2E:64 2F:AA 30:DA 31:A9 32:01 33:01 34:AF 35:A4 36:A8
37:AA 38:83
17-Jun-94 13:06:58 SWITCH*>SWITCH <DM>

XOXOXOX END DOVE PACKET SESSION XOXOXOX
```

942. GPS group purchase shutdown

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 17:26:53 UTC
From: bonomo@specxn.enet.dec.com
Message-ID: <2un24t$4go@nntpd2.cxo.dec.com>
Source record: 27396

Greetings, all.

As I have not achieved critical mass in the number of orders for the Motorola GPS engines, I am shutting down the group purchase.

I am on vacation for the next two weeks. If, upon returning, there has not been enough orders received to reach the magic 100 mark, I will be returning the checks to those who have sent them to me, and discontinuing any efforts in this area. As of now, I have orders for about 35 units. For those of you interested, that's about $13,000 sitting on my desk.

Thanks for your time, efforts and wonderful interest in this matter.

Regards,

Tom Bonomo

943. * SpaceNews 27-Jun-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-06-27 18:05:57 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0627.1994@ampr.org>
Source record: 27397
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0627
* SpaceNews 27-Jun-94 *

BID: $SPC0627

=========
SpaceNews
=========

MONDAY JUNE 27, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* DOVE TESTING CONTINUES *
==========
At about 6/11/94 05:30 UTC controllers completed a reload of the DOVE
software and activated another voice test. The pronunciation of the word
'Hi' is a bit different and the overall amplitude of the voice is higher.

Controllers expect to continue the hardware testing process after a period
of software development on the ground that will probably last several days
to a few weeks.

The following packet frames were received from DOVE by KD2BD late last week:

DOVE-1>TIME-1 <UI>:
PHT: uptime is 014/02:11:51. Time is Fri Jun 24 16:11:31 1994

DOVE-1>BRAMST <UI>:
0500 utc 14 June 1994

Voice Module now active
Software testing continues
S-Band transmitter is off

73 DOVE Command Team (WJ9F)

Reception reports of how well the voice is heard with simple receiving
equipment (like an HT and rubber duck) would be appreciated. Please send
reports via the Internet to WJ9F, PY2BJO, WD0E, VK7ZBX, or N5AHD @amsat.org.
Telemetry is not needed at this time.

[Info via Jim White, WD0E, of the DOVE command team]

* STS-65 SAREX INFORMATION *
==========
Shuttle mission STS-65 using orbiter "Columbia" is scheduled for launch

on 08-Jul-94 at 17:06 UTC for a 14-day microgravity scientific mission. A SAREX package in configuration 'C' will be carried on Columbia on this mission. Crew members Donald A. Thomas, Mission Specialist, KC5FVF, and Robert D. Cabana, (callsign?) are among the licensed astronauts flying on mission STS-65.

The primary payload for STS-65 is the International Microgravity Laboratory (IML-02), that includes a complement of international experiments with its main focus on materials and life sciences research in microgravity. The payload crew members will perform the experiments in a "gravity gradient" stabilized attitude (shuttle tail pointed toward Earth) to maintain the best possible laboratory conditions with the least gravitational disturbances in the Spacelab.

One of the secondary payloads will be the Shuttle Amateur Radio Experiment. SAREX configuration C consists of a 2-meter handheld transceiver, I/F module, PGSC, spare battery set, window antenna, packet module, SAREX headset assembly, personal recorder, and required cable assemblies. The packet module contains a power supply and packet TNC. The power supply provides power for the TNC and the handheld transceiver. The TNC interconnects with a radio transceiver so that data to and from the computer is transmitted to and received from other amateur radio stations. Configuration C is capable of operating in either the voice or data mode in communications with amateur stations within LOS of the Orbiter. This configuration can be operated in the attended mode for voice communication and either the attended or automatic mode for data communications. The payload control weight for SAREX configuration C is 45 lb (20.41 kg).

SAREX sponsors include the American Radio Relay League (ARRL), The Radio Amateur Satellite Corporation (AMSAT), and The National Aeronautics and Space Administration (NASA). SAREX is supported by the Federal Communications Commission (FCC).

The crew will use separate receive and transmit frequencies. PLEASE DO NOT transmit on the Shuttle's downlink frequency. The SAREX frequencies for mission STS-65 are as follows:

Voice Downlink: (Worldwide) 145.55 MHz [Receive Only]
Voice Uplink: 144.91, 144.93, 144.95, 144.97, 144.99 MHz
Voice Uplink: (Europe only) 144.70, 144.75, 144.80 MHz
Packet Downlink: 145.55 MHz
Packet Uplink: 144.49 MHz

KC5FVF is the callsign that will be used for making voice contacts. W5RRR-1 will be used for packet radio connections.

QSLs and reception (SWL) reports should be sent to the ARRL EAD, STS-65 QSL, 225 Main Street, Newington, CT 06111, USA. Include the following information in your QSL or report: STS-65, date, time in UTC, frequency and mode (FM voice or packet). In addition, a large, business sized SASE must be included if you wish to receive a card in return. The Lake County Amateur Radio Club in Munster, Indiana, has generously volunteered to manage

the cards for this mission.

The following is STS-65 Keplerian element set JSC-003:

STS-65
1 00065U 94189.76284929 .00052344 00000-0 15762-3 0 37
2 00065 28.4664 13.0731 0003571 330.7493 29.2906 15.90324781 23

Satellite: STS-65
Catalog number: 00065
Epoch time: 94189.76284929 = (08 JUL 94 18:18:30.18 UTC)
Element set: 003
Inclination: 28.4664 deg
RA of node: 13.0731 deg Space Shuttle Flight STS-65
Eccentricity: .0003571 Prelaunch Element set JSC-003
Arg of perigee: 330.7493 deg Launch: 08 JUL 94 17:06 UTC
Mean anomaly: 29.2906 deg
Mean motion: 15.90324781 rev/day Gil Carman, WA5NOM
Decay rate: 5.2344e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 289

[Info via The American Radio Relay League]

* InfoEspace *
==============
As of 20-Jun-94, VE2TRV, has started translating SpaceNews into French for the francophone VE2-population. Mike has noted a lot of recent interest in astronomy and space-related subjects, and believes the French language version of SpaceNews will become very popular. Mike has been translating some articles from SpaceNews for the Laval Laurentian ARC newsletter, and reports the 360 members really appreciate it.

My thanks to VE2TRV for the time and effort of performing the language translation!

* RS-14 / RS-10 OBSERVATION *
============================
During a recent pass of RS-10 over the central United States, OSCAR-21's (RS-14) CW beacon (145.822 MHz) was observed through RS-10's ROBOT on 29.403 MHz at 21:36 UTC on 24-Jun-94.

Orbital analysis showed RS-10 over southern Oklahoma and heading south, while RS-14/AO-21 was over the east coast of Mexico and heading north when the beacon was heard.

Although RS-10's ROBOT input passband (centered on 145.820 MHz) is several kilohertz wide, RS-14's telemetry was heard for only a short period of time because of the high relative motion between the two spacecraft. The Doppler shift this motion produced was well in excess of the ROBOT input passband. The beacon received from RS-14 by RS-10 drifted quicky through the ROBOT passband as the two satellites passed one another over the south central United States.

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

N1MDZ VE2TRV G3RHP F5OYH

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@amsat.org -or- magliaco@pilot.njin.net

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

944. POSAT GPS information?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-28 14:07:26 UTC
From: thomsona@netcom.com
Message-ID: <thomsonaCs41wF.6y6@netcom.com>
Source record: 27398

Can anyone out there send me information on the GPS experiment
on POSAT? Equipment, experimental design and goals, results?

TIA

945. Re: Element Files Standard

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 11:34:31 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <rlong-290694072058@slip1-22.acs.ohio-state.edu>
Source record: 27399

In article <n7ryw.21.000054E6@teleport.com>, n7ryw@teleport.com (William
Roth) wrote:

>
> This makes it very difficult for programmers and users alike to find these
> files when it comes time to update. Since this is done as often as 3 times a
> week or more, I think that there should be some sort of standardization for
> the filenames used.

This is unlikely since the names that amateurs wish to call their
satellites are not the same as those assigned by NASA.
>
> I won't go into what I have been thinking of, since I would rather hear
> completely fresh opinions, unbiased by my suggestions. I have had a few
> responses on the two Kitsats where I posted a similar request, but I want to
> hear from as many as possible before throwing out a proposition.
>
> Filenamse are not the only problem. Usually there is extraneous text included
> in the files. This text, though sometimes informative, is enough to drive a
> programmer to take up knitting instead! If anyone has ideas on how to separate
> this extra text, while preserving useability, I would love to hear it!!!

The ID numbers are the starting point. The solution is you write a
little program that processes the original 2 line file from NASA.
It includes a second file which you prepare that has the ID numbers
and the name YOU want to assign to that ID number. The output file
is a changed 2 line file with your names, sans stray spaces etc.
This is not original with me. Will Marchant, KC6ROL, did this for
a special purpose last year.
>
> I will be checking this area for about a week before I formulate a
> proposition, which I will send out for comment, and then present to Amsat,
> NASA, and whoever else might help in implementing a standard.

I hate to throw cold water on an idea but the 'proposal' would be
a waste of time. Neither organization is going to listen or change.
>
73,
Ron w8gus.

946. Re: Element Files Standard

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 12:59:36 UTC
From: thomsona@netcom.com
Message-ID: <thomsonaCs5tFC.Fxs@netcom.com>
Source record: 27400

In article <n7ryw.21.000054E6@teleport.com> n7ryw@teleport.com (William Roth) writes:
>Over the years, I seen a lot of different ways of elements being sent. They
>seem to have boiled down to two types, Amsat and Two line. This is fine, since
>most tracking programs will read both, but there seems to be no
>standardization for filenames.
>
[snip]
>
>Filenamse are not the only problem. Usually there is extraneous text included
>in the files. This text, though sometimes informative, is enough to drive a
>programmer to take up knitting instead! If anyone has ideas on how to separate
^^^^^^
>this extra text, while preserving useability, I would love to hear it!!!
^^^^^^^^^^^^^^^

For files containing 2-line elements, try

```
grep '^[12] [0-2]' oldfile > newfile
```

Or you can use a short BASIC program:

```
OPEN "OLDFILE" FOR INPUT AS #1
OPEN "NEWFILE" FOR INPUT AS #2

WHILE NOT EOF(1)
LINE INPUT #1, A$
B$ = LTRIM$(RTRIM$(A$))

IF (LEFT$(B$,2) = "1 " OR LEFT$(B$,2) = "2 ")) AND LEN(B$) = 69 THEN
PRINT #2, B$
END IF

WEND
CLOSE
END
```

947. Re: decoding telemetry by telephone modem ?

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 13:37:50 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jun29.133750.2720@ke4zv.atl.ga.us>
Source record: 27404

In article <juergen.putzger.16.0@physik.uni-regensburg.de>
juergen.putzger@physik.uni-regensburg.de (Juergen Putzger) writes:
>I would like to decode the telemetry of DOVE-OSCAR17. Is it possible to do
>this with an ordinary telephone modem (Hayes compatible, max. 2400 Baud) ?
>The transmission rate is 1200 Baud AFSK (like packet radio). A circuit will
>be needed to simulate the telephone line, i suppose a DC-source in
>series with a transformer would do the job. Has anyone tried this with
>success?

Sorry, the packet signals are Bell 202 standard, your modem is Bell 212
at 1200 baud. They aren't compatable. However, a cheap little Baycom
adapter will work with the PC.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

948. Re: AO-13 and Field Day

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 14:59:27 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Jun29.145927.730@gov.nt.ca>
Source record: 27401

In article <1994Jun29.083523.6609@ee.ubc.ca> davem@ee.ubc.ca (Dave Michelson) writes:
>Did anyone else manage to work anybody through AO-13 on Field Day?
>
We heard the beacons loud and clear but the transponders were
>absolutely silent. Was this just a case of a really bad squint angle
>or was there something else going on?
>
--
>Dave Michelson ve7tsx
>davem@ee.ubc.ca
>

Same here. I think it was the squint angle though. At about 1130UTC
I did manage to hear my own CW and a few other stations on the downlink
but signals were too weak for me to copy. It does seem strange that
it was not working at the beginning of the orbit. I had the beacon
at S-9 when it was already 11000 km out but nothing else was heard.
Oh well. Moving to attitude 180/0 on July 11 :-) :-) :-) :-)
==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

949. S. Trakcing Prg Recommendation

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 17:40:13 UTC
From: 2575brooksr@vms.csd.mu.edu
Message-ID: <00980AD4.9F796FA0@vms.csd.mu.edu>
Source record: 27402

I was wondering if anyone had suggestions as to which Sat Track
software would be good to use on a 286 laptop with only a HD
floppy? I'm currently using TrakSat, but it just barely runs...
and sometimes crashes.

Thanks for any input.
Ryan Brooks

950. Re: AO-13 and Field Day

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 18:03:04 UTC
From: nburnett@nyx10.cs.du.edu
Message-ID: <2usd0o$gfc@nyx10.cs.du.edu>
Source record: 27403

davem@ee.ubc.ca (Dave Michelson) writes:

>Did anyone else manage to work anybody through AO-13 on Field Day?

>We heard the beacons loud and clear but the transponders were
>absolutely silent. Was this just a case of a really bad squint angle
>or was there something else going on?

>--
>Dave Michelson ve7tsx
>davem@ee.ubc.ca

Yes at the USECA clubs FD we made a few QSO's on AO-13 right as the contest began and then a few more on it's next pass closer to the end of the contest.

73, Nate N8MBK
nburnett@nyx.cs.du.edu

951. Re: AO-13 and Field Day

Newsgroup: rec.radio.amateur.space
Date: 1994-06-29 23:08:15 UTC
From: sgreene@access1.digex.net
Message-ID: <2ususv$mf4@access1.digex.net>
Source record: 27405

In article <1994Jun29.083523.6609@ee.ubc.ca>,
Dave Michelson <davem@ee.ubc.ca> wrote:
>Did anyone else manage to work anybody through AO-13 on Field Day?
>
>We heard the beacons loud and clear but the transponders were
>absolutely silent. Was this just a case of a really bad squint angle
>or was there something else going on?
>
>--
>Dave Michelson ve7tsx
>davem@ee.ubc.ca
>
>
>
>
>

952. Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-06-30 08:23:36 UTC
From: niall@crystal.king.ac.uk
Message-ID: <2utve8$l2k@mercury.king.ac.uk>
Source record: 27406

This post is a follow-up to my post last week about a satellite tracking system which I am hoping to write in C for my final year project.

Thanks to the numerous people who replies with suggestions and clips of code in numerous different languages (I didn't realise how similar all these languages were - amazing how much you can relate to either C or Modula-2). Thanks also to all the people who offered to rip the guts out of their programs and send me a sysnposis (is that the right word?) of the code contained therein.

To those others who requested that I let them know what the outcome was. The answers all lie in the book "Satellite Experimenter's Handbook" by Martin Davidoff, published by the ARRL. This contains a chapter which runs through - step by step - all the formulae and computations needed to track a satellite in real time from the Kepler elements.

The book also explains everything else you could ever want to know about satellites, including specific details on each 'bird' (I might as well try and get the terminology correct).

In response to Tom <WB7ASR> who suggested that I write my program as a Windows .DLL in C++ I can only say this. What kind of nutter masochist do you think I am? I have done some windows applications programming in my time and I can imagine how hard decent graphics are to do. *imagine a sad shake of the head around here*

The good news for Tom is that the finished result WILL have rotator control - in fact that is the whole point of my project. To write a tracking system which will actually track a satellite. In fact it will track a number of them.

The project is unlikely to be finished for another nine months or so - I am just beginning now - but when it is I will be more than happy to make sources and hardware specifications available to anyone who wants them. I will post to this group when they are ready but don't hold your breath.

Thanks again to all those who helped, especially Neill Taylor <G4HLX> who sent me a PASCAL listing which did everything I wanted to do. I have never programmed in PASCAL and don't claim to understand it but his code was so well commented that it was quite easy to understand. It made a lot of murky things somewhat clearer.

Sorry for the exceptionally long post but I wanted to make sure that everyone who had helped knows how grateful I am. You all know who you are, sorry I couldn't reply individually but you wouldn't believe how much mail I got.

In my opinion the response to this request has justified my belief in both this list and in the world-wide society of Radio Amateurs in general.

Thanks,

-Niall

--========--
Niall Pagdin, Student Advisory (SC), Kingston University,
Kingston-upon-Thames, London, England.
E~Mail: niall@crystal.king.ac.uk

- G7PDX -

"Only those who attempt the absurd, achieve the impossible!"

953. Re: AO-13 and Field Day

Newsgroup: rec.radio.amateur.space
Date: 1994-06-30 14:04:44 UTC
From: stu@ash.lab.r1.fws.gov
Message-ID: <2uujds$4jm@ash.lab.r1.fws.gov>
Source record: 27407

davem@ee.ubc.ca (Dave Michelson) writes:

>Did anyone else manage to work anybody through AO-13 on Field Day?

>We heard the beacons loud and clear but the transponders were
>absolutely silent. Was this just a case of a really bad squint angle
>or was there something else going on?

I was able to work 2 people in during the first 15 minutes of the
contest. Since I only needed one, I didn't listen any longer. Tough
job, huh!? Did you check the mode schedule? I noticed that a while
back somebody in Italy reported that the bird was off between 0
and 80. The official reports say it's on, but when I listened during
the week prior to FD, it didn't appear to be on until MA 80. I did hear
the beacon though...

--
Stu Mitchell stu@lab.r1.fws.gov
USFWS Forensic Lab mitchellstu@fws.gov
Ashland, Oregon wd4eck@w7oek
*** These are my opinions, not the Government's ***

954. Re: AO-13 and Field Day

Newsgroup: rec.radio.amateur.space
Date: 1994-06-30 14:49:50 UTC
From: n4nr@vulcan.com
Message-ID: <R0Jqoc2w165w@vulcan.com>
Source record: 27409

ve8ev@gov.nt.ca (John Boudreau) writes:

> In article <1994Jun29.083523.6609@ee.ubc.ca> davem@ee.ubc.ca (Dave Michelson)
> >Did anyone else manage to work anybody through AO-13 on Field Day?
> >
> We heard the beacons loud and clear but the transponders were
> >absolutely silent. Was this just a case of a really bad squint angle
> >or was there something else going on?
> >
> --
> >Dave Michelson ve7tsx
> >davem@ee.ubc.ca
> >
>
> Same here. I think it was the squint angle though. At about 1130UTC
> I did manage to hear my own CW and a few other stations on the downlink
> but signals were too weak for me to copy. It does seem strange that
> it was not working at the beginning of the orbit. I had the beacon
> at S-9 when it was already 11000 km out but nothing else was heard.
> Oh well. Moving to attitude 180/0 on July 11 :-) :-) :-) :-)
> ==
> John Boudreau VE8EV INTERNET: ve8ev@amsat.org
> Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
> ==
>
>

Could it be that you were listening during the time that mode B was off?
The schedule according to the cw beacon had mode b switched off for quite
a while around perogee....This was never (to my knowledge) published in
the written schedules, but when I copied the beacon, sure 'nuff...the
command team said mode b was off around perogee.......
as for contacts, we made 80 contacts, (42 on AO-13, 33 on AO-10 and 5 on
FO-20) and we were using only cush-craft antennas......don't think that
our differences in QTH would make much difference, as we both suffered
poor squint angles and condx....maybe just unlucky timing?

--
Dennis T. Dease internet - n4nr@vulcan.com (or n4nr@amsat.org)
Pelham, Alabama, USA packet radio - n4nr@kd4cim.al.usa.na

955. Re: Newbie Experience with DOVE Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-06-30 17:51:11 UTC
From: battin@cyclops.iucf.indiana.edu
Message-ID: <Cs81LC.Ezr@usenet.ucs.indiana.edu>
Source record: 27408
Cross-posted to: alt.radio.scanner,rec.radio.amateur.space

In article <1994Jun27.154429.3566@radian.uucp>, Phil Riba (philr@radian.com) wrote:
> Newbie Experience with DOVE Satellite

> I finally decided to see if I could "catch" my first
> satellite last week. Since DOVE is supposed to be so
> easy to hear, I decided that it would be my target.
> Everything you've heard about it is TRUE. I fired up
> a tracking program, determined when the next pass would
> be, and then turned on my ICOM handi-talkie. Right on
> schedule, there it was saying, "HI, THIS IS DOVE IN SPACE."
> Would could be easier? I thought I'd share my experience
> with the net just in case there are any others out there
> who have been wanting to try and hear a satellite first
> hand, but haven't ever gotten around to it.

[snip,snip]

I want to thank you for this informative article.
I heard DOVE today (around 11:40 am, EST) with
a simple 1/4-wave ground-plane on my HTX-202, by
following your advice to just monitor 145.825, since
I don't have any tracking prog set up yet.
I might mention that the DOVE team is interested in
reports on how well simple equipment does at receiving
the satellite - the last SpaceNews article has an
internet address for sending reception reports, although
I unfortunately didn't document my reception well enough
to say anything other than that I _could_ hear it.

Anyhow, thanks again for the neat info!

--
Gene Battin, N9XAM
battin@iucf.indiana.edu

956. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-07-01 03:00:08 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_773031607@ve6mgs.ampr.org>
Source record: 27261
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

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Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
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a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

< Dated information here >

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat

transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

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Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

957. Re: help-which radio?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-01 12:26:22 UTC
From: "Colin R. Wright" <lifeform@delphi.com>
Message-ID: <xwyxBse.lifeform@delphi.com>
Source record: 27410

Currently, I'm using the FT-736R and have no experience with the ICOM 970A. I've only just gotten my equipment up on the satellites in the last week -- my 736R was purchased for terristrial Dxing -- but I have to say I'm very pleased with the results. I have been able to use all the SSB/FM/CW satellites I have tried (AO-10, AO-13, FO-20, AO-21, RS-12, RS-10) and have had no problems. I must add some comments about antennae, though. I originally, like you, had a desire to set up a station and invested in the Yaesu 5400 az-el rotor (which I really like) and the Cushcraft AOP-1 antenna set. I never made the first QSO with these antennas. They are currently in my garage, and have been replaced with the KLM 40CX and 22-element 2M beam. That pair of antennae, however large they may be, certainly have made all the difference in the world. The polarity switching on them can be handy, and they certainly seem to do a wonderful job for me. I hope this helps.

Colin R. Wright, AD4HJ
Chattanooga, TN
LIFEFORM@DELPHI.COM

958. ORBS$.182.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-01 20:16:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-182.o.1994@ampr.org>
Source record: 27265
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-182.O
Orbital Elements 182.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX July 1, 1994
BID: $ORBS-182.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94176.41110075
Element set: 289
Inclination: 27.0856 deg
RA of node: 321.0039 deg
Eccentricity: 0.6024383
Arg of perigee: 189.2195 deg
Mean anomaly: 150.8337 deg
Mean motion: 2.05882336 rev/day
Decay rate: -3.06e-06 rev/day^2
Epoch rev: 8295
Checksum: 298

Satellite: UO-11
Catalog number: 14781
Epoch time: 94173.06474633
Element set: 702
Inclination: 97.7861 deg
RA of node: 187.5613 deg
Eccentricity: 0.0010677
Arg of perigee: 254.9523 deg
Mean anomaly: 105.0499 deg
Mean motion: 14.69223055 rev/day
Decay rate: 1.36e-06 rev/day^2
Epoch rev: 55102
Checksum: 307

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94180.82901643
Element set: 918
Inclination: 82.9242 deg
RA of node: 319.4951 deg
Eccentricity: 0.0012229
Arg of perigee: 356.9772 deg
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Mean anomaly: 3.1307 deg
Mean motion: 13.72338758 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 35164
Checksum: 306

Satellite: AO-13
Catalog number: 19216
Epoch time: 94180.17114065
Element set: 926
Inclination: 57.7928 deg
RA of node: 244.7541 deg
Eccentricity: 0.7213733
Arg of perigee: 344.7303 deg
Mean anomaly: 1.9030 deg
Mean motion: 2.09725008 rev/day
Decay rate: -4.92e-06 rev/day^2
Epoch rev: 4626
Checksum: 292

Satellite: FO-20
Catalog number: 20480
Epoch time: 94180.92151497
Element set: 701
Inclination: 99.0361 deg
RA of node: 330.3349 deg
Eccentricity: 0.0540560
Arg of perigee: 310.6901 deg
Mean anomaly: 44.8395 deg
Mean motion: 12.83226179 rev/day
Decay rate: -1.0e-07 rev/day^2
Epoch rev: 20576
Checksum: 284

Satellite: AO-21
Catalog number: 21087
Epoch time: 94180.84490761
Element set: 484
Inclination: 82.9449 deg
RA of node: 133.3485 deg
Eccentricity: 0.0037046
Arg of perigee: 49.6353 deg
Mean anomaly: 310.8027 deg
Mean motion: 13.74541737 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 17132
Checksum: 312

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94177.55866591

Element set: 703
Inclination: 82.9190 deg
RA of node: 4.4957 deg
Eccentricity: 0.0030799
Arg of perigee: 81.6385 deg
Mean anomaly: 278.8252 deg
Mean motion: 13.74042909 rev/day
Decay rate: 4.8e-07 rev/day^2
Epoch rev: 16993
Checksum: 351

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94169.23096299
Element set: 263
Inclination: 1.8748 deg
RA of node: 99.1484 deg
Eccentricity: 0.2919067
Arg of perigee: 184.0582 deg
Mean anomaly: 172.2245 deg
Mean motion: 1.42202724 rev/day
Decay rate: -1.11e-06 rev/day^2
Epoch rev: 121
Checksum: 288

/EX

959. ORBS$182.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-01 20:17:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-182.d.1994@ampr.org>
Source record: 27266
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-182.D
Orbital Elements 182.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX July 1, 1994
BID: $ORBS-182.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94181.17094406
Element set: 6
Inclination: 98.5888 deg
RA of node: 265.7706 deg
Eccentricity: 0.0011270
Arg of perigee: 148.7156 deg
Mean anomaly: 211.4700 deg
Mean motion: 14.29848006 rev/day
Decay rate: 1.2e-07 rev/day^2
Epoch rev: 23144
Checksum: 288

Satellite: AO-16
Catalog number: 20439
Epoch time: 94178.21712155
Element set: 804
Inclination: 98.5981 deg
RA of node: 264.1007 deg
Eccentricity: 0.0011033
Arg of perigee: 158.0706 deg
Mean anomaly: 202.0949 deg
Mean motion: 14.29901614 rev/day
Decay rate: 1.0e-07 rev/day^2
Epoch rev: 23103
Checksum: 269

Satellite: DO-17
Catalog number: 20440
Epoch time: 94178.24044877
Element set: 804
Inclination: 98.5990 deg
RA of node: 264.4494 deg
Eccentricity: 0.0011506
Arg of perigee: 157.3761 deg
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Mean anomaly: 202.7928 deg
Mean motion: 14.30041300 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 23105
Checksum: 287

Satellite: WO-18
Catalog number: 20441
Epoch time: 94181.15467102
Element set: 807
Inclination: 98.5977 deg
RA of node: 267.3273 deg
Eccentricity: 0.0012054
Arg of perigee: 149.3828 deg
Mean anomaly: 210.8060 deg
Mean motion: 14.30015655 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 23147
Checksum: 283

Satellite: LO-19
Catalog number: 20442
Epoch time: 94178.75317896
Element set: 803
Inclination: 98.5991 deg
RA of node: 265.2158 deg
Eccentricity: 0.0012241
Arg of perigee: 155.8695 deg
Mean anomaly: 204.3055 deg
Mean motion: 14.30111899 rev/day
Decay rate: 3.1e-07 rev/day^2
Epoch rev: 23114
Checksum: 309

Satellite: UO-22
Catalog number: 21575
Epoch time: 94181.15732371
Element set: 508
Inclination: 98.4344 deg
RA of node: 255.3931 deg
Eccentricity: 0.0006801
Arg of perigee: 252.7171 deg
Mean anomaly: 107.3281 deg
Mean motion: 14.36921644 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 15494
Checksum: 295

Satellite: KO-23
Catalog number: 22077
Epoch time: 94181.22418147

Element set: 403
Inclination: 66.0834 deg
RA of node: 252.6851 deg
Eccentricity: 0.0014564
Arg of perigee: 283.4501 deg
Mean anomaly: 76.4893 deg
Mean motion: 12.86286916 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8846
Checksum: 315

Satellite: AO-27
Catalog number: 22825
Epoch time: 94179.73033811
Element set: 301
Inclination: 98.6528 deg
RA of node: 255.4221 deg
Eccentricity: 0.0008353
Arg of perigee: 170.1806 deg
Mean anomaly: 189.9539 deg
Mean motion: 14.27627600 rev/day
Decay rate: -1.0e-08 rev/day^2
Epoch rev: 3933
Checksum: 300

Satellite: IO-26
Catalog number: 22826
Epoch time: 94179.21993428
Element set: 301
Inclination: 98.6522 deg
RA of node: 254.9542 deg
Eccentricity: 0.0008849
Arg of perigee: 173.5876 deg
Mean anomaly: 186.5418 deg
Mean motion: 14.27731640 rev/day
Decay rate: -3.0e-08 rev/day^2
Epoch rev: 3926
Checksum: 333

Satellite: KO-25
Catalog number: 22830
Epoch time: 94179.22798762
Element set: 306
Inclination: 98.5529 deg
RA of node: 252.0960 deg
Eccentricity: 0.0012037
Arg of perigee: 140.4552 deg
Mean anomaly: 219.7507 deg
Mean motion: 14.28058431 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 3927

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Checksum: 303

/EX
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960. ORBS$182.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-01 20:20:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-182.m.1994@ampr.org>
Source record: 27267
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-182.M
Orbital Elements 182.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX July 1, 1994
BID: $ORBS-182.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94179.72381534
Element set: 294
Inclination: 98.6491 deg
RA of node: 255.4805 deg
Eccentricity: 0.0010222
Arg of perigee: 158.5288 deg
Mean anomaly: 201.6320 deg
Mean motion: 14.28031163 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 3934
Checksum: 291

Satellite: MIR
Catalog number: 16609
Epoch time: 94181.23244135
Element set: 659
Inclination: 51.6459 deg
RA of node: 121.1314 deg
Eccentricity: 0.0003021
Arg of perigee: 97.4905 deg
Mean anomaly: 262.6430 deg
Mean motion: 15.56430535 rev/day
Decay rate: 3.287e-05 rev/day^2
Epoch rev: 47807
Checksum: 286

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94180.20403819
Element set: 501
Inclination: 28.4677 deg
RA of node: 158.7789 deg
Eccentricity: 0.0006123
Arg of perigee: 208.6089 deg
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Mean anomaly: 151.4157 deg
Mean motion: 14.90631325 rev/day
Decay rate: 3.62e-06 rev/day^2
Epoch rev: 3118
Checksum: 285

Satellite: GRO
Catalog number: 21225
Epoch time: 94178.31390620
Element set: 117
Inclination: 28.4589 deg
RA of node: 161.8278 deg
Eccentricity: 0.0003293
Arg of perigee: 325.3791 deg
Mean anomaly: 34.6587 deg
Mean motion: 15.40981386 rev/day
Decay rate: 1.129e-05 rev/day^2
Epoch rev: 5850
Checksum: 307

Satellite: UARS
Catalog number: 21701
Epoch time: 94179.26756800
Element set: 544
Inclination: 56.9843 deg
RA of node: 114.6578 deg
Eccentricity: 0.0006029
Arg of perigee: 104.7294 deg
Mean anomaly: 255.4410 deg
Mean motion: 14.96431723 rev/day
Decay rate: -2.189e-05 rev/day^2
Epoch rev: 15259
Checksum: 311

/EX

961. Two-Line Orbital Element Sets (TLE423)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-02 13:58:56 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.773157536@afit.af.mil>
Source record: 27262

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

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- Current Two-Line Element Sets #423 -
Alouette 1
1 00424U 62049 94181.22090566 .00000071 00000-0 72294-4 0 69
2 00424 80.4636 272.1392 0024417 81.3661 279.0247 13.67813938584184
ATS 1
1 02608U 66110A 94177.74074147 -.00000313 00000-0 10000-3 0 8825
2 02608 14.5607 0.3212 0010344 45.8829 67.3930 1.00375047 17561
ATS 3
1 03029U 67111A 94180.27253296 -.00000124 00000-0 10000-3 0 2128
2 03029 14.6606 7.3309 0009046 265.1586 357.4909 1.00273176 97553
Cosmos 398
1 04966U 71016A 94180.73815870 .00100135 74302-5 21067-3 0 3186
2 04966 51.4368 280.6026 1012280 41.4532 325.8853 13.90921367774497
Starlette
1 07646U 75010A 94177.18897589 -.00000159 00000-0 -11573-4 0 7928
2 07646 49.8250 117.8287 0205748 5.9639 354.3636 13.82186786979099
LAGEOS
1 08820U 76039A 94176.87456056 -.00000001 00000-0 10000-3 0 66
2 08820 109.8214 138.5742 0044326 283.1733 76.3826 6.38664321167703
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94179.46908054 .00000066 00000-0 00000+0 0 3591
2 10061 11.2237 45.5705 0001658 6.8954 256.2944 1.00271415 7228
IUE
1 10637U 78012A 94177.58717309 -.00000279 00000-0 10000-3 0 133
2 10637 34.5952 94.6747 1315754 36.2551 305.7468 1.00265078 12816
GPS BI-01
1 10684U 78020A 94178.83804116 -.00000063 00000-0 10000-3 0 2780
2 10684 64.6502 45.2048 0062209 162.8075 197.4390 1.98069389105142
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GPS BI-02
1 10893U 78047A 94179.16469670 -.00000057 00000-0 10000-3 0 781
2 10893 63.5316 284.0907 0214548 14.0870 346.5490 2.01627765118299
GOES 3
1 10953U 78062A 94171.10064821 .00000063 00000-0 10000-3 0 3228
2 10953 10.1336 48.3721 0006089 51.2491 31.2883 1.00240735 11755
SeaSat 1
1 10967U 78064A 94178.20650162 -.00000008 00000-0 41892-4 0 3013
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2 11080 99.0532 60.5016 0009589 105.1921 255.0295 13.83730753791328
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2 11783 62.6486 277.9173 0210808 29.2317 331.9825 2.03456667104143
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METEOSAT 3
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2 21855 64.9010 108.7305 0007264 210.8213 149.1329 2.13102012 18744
JERS-1
1 21867U 92007A 94180.16982904 .00001328 00000-0 11555-3 0 3430
2 21867 97.7493 255.0317 0003422 114.5940 245.5640 14.98634504130175
GPS BIIA-12
1 21890U 92009A 94180.23338994 -.00000046 00000-0 10000-3 0 5242
2 21890 54.1171 256.2593 0056890 168.6288 191.5616 2.00568021 17225
GPS BIIA-13
1 21930U 92019A 94178.45056477 -.00000091 00000-0 10000-3 0 5039
2 21930 55.6160 17.4219 0051166 167.9056 192.2629 2.00564567 16112
EUVE
1 21987U 92031A 94177.61255628 .00000855 00000-0 30687-4 0 3119
2 21987 28.4350 350.5014 0009892 79.6930 280.4753 15.18589763113839
SAMPEX
1 22012U 92038A 94179.89936889 .00000376 00000-0 30926-4 0 5333
2 22012 81.6694 158.5126 0119582 2.1686 358.0022 14.90988445108023
GPS BIIA-14
1 22014U 92039A 94175.98930776 .00000039 00000-0 00000+0 0 4218
2 22014 54.8735 197.4336 0084865 300.2250 58.9729 2.00562544 7903
Glonass 56
1 22056U 92047A 94177.29586929 -.00000071 00000-0 00000+0 0 8958
2 22056 64.9272 348.5892 0003268 270.4519 89.5143 2.13102798 14809
Glonass 57
1 22057U 92047B 94180.87494226 -.00000059 00000-0 00000+0 0 8939
2 22057 64.9398 348.4859 0006447 330.2190 29.7468 2.13102385 14856
Glonass 58
1 22058U 92047C 94178.46939265 -.00000068 00000-0 00000+0 0 9053
2 22058 64.9237 348.5623 0007885 274.6077 85.3390 2.13102837 14855
TOPEX
1 22076U 92052A 94181.23428870 -.00000038 00000-0 10000-3 0 7761
2 22076 66.0449 263.9026 0007422 263.9378 96.0793 12.80930187 88165
KO-23
1 22077U 92052B 94181.22418147 -.00000037 00000-0 10000-3 0 4033
2 22077 66.0834 252.6851 0014564 283.4501 76.4893 12.86286916 88461
S80/T
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1 22078U 92052C 94180.68513480 -.00000037 00000-0 10000-3 0 4006
2 22078 66.0834 253.0851 0016144 284.0230 75.8994 12.86569175 88465
GPS BIIA-15
1 22108U 92058A 94177.45339510 -.00000031 00000-0 10000-3 0 4191
2 22108 54.3361 257.0911 0110002 139.3673 221.5409 2.00554898 13118
FREJA
1 22161U 92064A 94179.26654793 -.00000160 00000-0 -24110-4 0 4159
2 22161 63.0009 264.6607 0784825 316.0760 38.0351 13.21765575 83261
LAGEOS II
1 22195U 92070B 94180.18391972 -.00000009 00000-0 10000-3 0 3065
2 22195 52.6539 86.0913 0138814 122.4527 238.9540 6.47293846 39727
GPS BIIA-16
1 22231U 92079A 94180.13409260 .00000045 00000-0 00000+0 0 4166
2 22231 54.7226 198.5039 0037329 295.9640 63.6889 2.00556474 11748
GPS BIIA-17
1 22275U 92089A 94176.28660796 .00000036 00000-0 00000+0 0 4226
2 22275 54.6488 196.1895 0054197 256.7694 102.6699 2.00564168 11073
TDRS 5
1 22314U 93003B 94180.39835419 -.00000285 00000-0 10000-3 0 4086
2 22314 1.0986 74.2303 0002849 35.4072 265.3990 1.00272549 5370
GPS BIIA-18
1 22446U 93007A 94174.36269470 -.00000093 00000-0 00000+0 0 4121
2 22446 54.6646 317.0557 0073050 345.4546 14.3280 2.00571593 10028
Glonass 59
1 22512U 93010A 94179.38915379 .00000005 00000-0 00000+0 0 5945
2 22512 64.9161 108.5614 0008755 204.2576 155.7231 2.13102043 10356
Glonass 60
1 22513U 93010B 94180.73708245 -.00000004 00000-0 00000+0 0 6063
2 22513 64.9042 108.5275 0006698 201.9520 158.0217 2.13102607 10575
Glonass 61
1 22514U 93010C 94178.15768865 .00000007 00000-0 00000+0 0 5905
2 22514 64.9215 108.6102 0013146 195.6170 164.3423 2.13101545 10528
ASTRO-D
1 22521U 93011A 94179.85807698 .00000423 00000-0 29507-4 0 3043
2 22521 31.1048 2.6487 0076127 207.3205 152.3433 14.93255432 73841
UFO F1
1 22563U 93015A 94178.95064083 .00000045 00000-0 10000-3 0 3032
2 22563 26.6281 299.6379 0002162 223.7126 321.4247 0.99248731 8941
GPS BIIA-19
1 22581U 93017A 94177.99312902 -.00000092 00000-0 10000-3 0 3126
2 22581 55.1246 17.1688 0049430 35.6609 324.6590 2.00566795 9157
ARSENE
1 22654U 93031B 94169.23096299 -.00000111 00000-0 00000+0 0 2631
2 22654 1.8748 99.1484 2919067 184.0582 172.2245 1.42202724 1217
GPS BIIA-20
1 22657U 93032A 94178.62960856 -.00000093 00000-0 00000+0 0 3266
2 22657 55.1533 16.9723 0063832 206.1652 153.4811 2.00555298 4494
RADCAL
1 22698U 93041A 94178.40479954 .00000057 00000-0 19065-4 0 3086
2 22698 89.5462 308.8689 0091380 152.5894 208.0157 14.21314164 52041
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GPS BIIA-21
1 22700U 93042A 94177.59605267 -.00000033 00000-0 00000+0 0 3065
2 22700 54.5170 257.8140 0027285 321.5383 38.3429 2.00553130 7275
NOAA 13
1 22739U 93050A 94180.83972637 -.00000057 00000-0 -67737-5 0 4799
2 22739 98.9493 125.1797 0010909 84.4739 275.7678 14.10899533 45748
GPS BIIA-22
1 22779U 93054A 94178.68065126 -.00000090 00000-0 10000-3 0 3427
2 22779 54.7885 316.8110 0022460 230.1094 129.6888 2.00573519 6054
Meteor 2-21
1 22782U 93055A 94179.43666165 .00000060 00000-0 40927-4 0 3121
2 22782 82.5481 197.5190 0021368 190.8398 169.2306 13.83009779 41640
UFO F2
1 22787U 93056A 94176.90000000 -.00000388 00000-0 00000+0 0 2885
2 22787 4.8310 8.4370 0003536 246.1560 99.1990 1.00293840 34
SPOT 3
1 22823U 93061A 94179.21382700 -.00000127 00000-0 -38964-4 0 3225
2 22823 98.7115 253.5307 0000877 97.6932 262.4292 14.20032458 39056
STELLA
1 22824U 93061B 94180.74041226 -.00000040 00000-0 16743-5 0 3024
2 22824 98.6528 256.3040 0006279 165.2757 194.8606 14.27097351 39460
AO-27
1 22825U 93061C 94179.73033811 -.00000001 00000-0 17426-4 0 3017
2 22825 98.6528 255.4221 0008353 170.1806 189.9539 14.27627600 39339
IO-26
1 22826U 93061D 94179.21993428 -.00000003 00000-0 16668-4 0 3019
2 22826 98.6522 254.9542 0008849 173.5876 186.5418 14.27731640 39269
HEATHSAT
1 22827U 93061E 94180.18076279 .00000035 00000-0 31893-4 0 3633
2 22827 98.6496 255.8742 0008594 158.8170 201.3366 14.27843160 39407
PO-28
1 22829U 93061G 94179.72381534 .00000026 00000-0 28308-4 0 2946
2 22829 98.6491 255.4805 0010222 158.5288 201.6320 14.28031163 39347
KO-25
1 22830U 93061H 94179.22798762 .00000022 00000-0 26131-4 0 3060
2 22830 98.5529 252.0960 0012037 140.4552 219.7507 14.28058431 39271
GPS BIIA-23
1 22877U 93068A 94180.72783937 -.00000062 00000-0 10000-3 0 1355
2 22877 55.2230 77.9376 0032650 289.7702 69.9152 2.00574521 4984
METEOSAT 6
1 22912U 93073B 94177.40610122 -.00000094 00000-0 00000+0 0 1010
2 22912 0.8746 267.7512 0001985 244.1476 258.9010 1.00274274 624
HST Array
1 22920U 90037C 94178.33024584 .00002984 00000-0 23996-3 0 1618
2 22920 28.4769 160.8390 0003560 344.4914 15.5603 14.96976261 31019
Soyuz TM-18
1 22957U 94001A 94179.88407009 .00006204 00000-0 92902-4 0 1614
2 22957 51.6468 127.8783 0003253 89.5532 270.4742 15.56426121 26780
Meteor 3-6
1 22969U 94003A 94178.11572267 .00000051 00000-0 10000-3 0 748
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2 22969 82.5601 49.2551 0014164 240.8531 119.1166 13.16723373 20156
TUBSAT-B
1 22970U 94003B 94178.55981230 .00000051 00000-0 10000-3 0 641
2 22970 82.5584 48.9211 0014438 238.3037 121.6680 13.16821835 20212
ODERACS A
1 22990U 94006B 94180.56997233 .00065717 12031-4 20560-3 0 1138
2 22990 56.9821 269.4741 0009308 168.5281 191.6052 15.91762948 22144
ODERACS B
1 22991U 94006C 94178.40980338 .00053636 11464-4 17671-3 0 1031
2 22991 56.9798 279.8724 0010437 163.4666 196.6762 15.90944603 21792
ODERACS E
1 22994U 94006F 94180.24185378 .00023207 00000-0 11536-3 0 865
2 22994 56.9842 275.5790 0012524 166.8819 193.2614 15.81837123 22021
ODERACS F
1 22995U 94006G 94180.24047650 .00024086 00000-0 11881-3 0 1125
2 22995 56.9838 275.5694 0012853 167.2459 192.8938 15.81972362 22029
BREMSAT
1 22998U 94006H 94179.44106072 .00024180 00000-0 12394-3 0 935
2 22998 56.9871 280.1663 0010344 164.3873 195.7556 15.81178160 21737
GPS BIIA-24
1 23027U 94016A 94179.80956221 -.00000092 00000-0 00000+0 0 629
2 23027 54.9758 19.0128 0061783 190.2958 169.6183 2.00559096 2275
Glonass 62
1 23043U 94021A 94176.41609264 -.00000071 00000-0 00000+0 0 604
2 23043 64.8125 349.0837 0006180 172.9101 187.1256 2.13102867 1607
Glonass 63
1 23044U 94021B 94178.17598544 -.00000069 00000-0 00000+0 0 414
2 23044 64.8040 349.0286 0028553 200.7622 159.1104 2.13102945 1640
Glonass 64?
1 23045U 94021C 94177.82779909 -.00000070 00000-0 00000+0 0 470
2 23045 64.7845 349.0419 0002223 347.0245 12.9646 2.12796515 1630
GOES 8
1 23051U 94022A 94181.18946087 -.00000186 00000-0 00000+0 0 1205
2 23051 0.4184 265.0554 0001735 258.6173 92.7544 1.00260716 425
ProgressM23
1 23114U 94031A 94179.88407009 .00006204 00000-0 92902-4 0 386
2 23114 51.6468 127.8783 0003253 89.5532 270.4742 15.56426121 5884
Cosmos 2281
1 23119U 94032A 94180.03420396 .00006400 -12004-5 10000-4 0 431
2 23119 82.5781 8.4493 0066292 58.3646 302.3686 15.98691604 3486
1994032C
1 23121U 94 32 C 94169.00070756 .90059409 -62469-5 13805-2 0 79
2 23121 82.4527 20.5404 0012786 58.5489 301.7064 16.52752255 1739
FOTON 9
1 23122U 94033A 94180.07993143 .00074677 80275-5 11076-3 0 185
2 23122 62.8139 37.7658 0100277 111.0612 250.1290 15.95754848 2306
1994033B
1 23123U 94033B 94180.90039352 .00630010 82562-5 58149-3 0 420
2 23123 62.7956 34.0594 0059596 105.5961 258.5747 16.07967057 2440
Intelsat7F2
```

```
1 23124U 94034A 94173.84201086 -.00000116 00000-0 00000+0 0 231
2 23124 0.9686 184.0363 1998151 181.2956 167.6859 1.31955513 65
STRV-1A
1 23125U 94034B 94175.54638463 .00000263 00000-0 20396-3 0 117
2 23125 7.0305 182.6992 7275702 183.9209 162.8449 2.27290711 172
STRV-1B
1 23126U 94034C 94179.07027264 .00000053 00000-0 16655-3 0 111
2 23126 7.0284 181.2273 7278896 186.8060 150.6095 2.26889420 251
1994034D
1 23127U 94034D 94177.57843283 -.00000107 00000-0 10000-4 0 101
2 23127 7.0547 182.2556 7258705 185.2622 156.9149 2.20412074 219
1994035B
1 23133U 94035B 94180.01935495 .00000199 00000-0 10000-4 0 121
2 23133 26.9541 298.9265 5381249 179.7534 180.8361 5.08307210 250
1994032D
1 23134U 94032D 94180.73572916 .00451919 58163-4 23403-2 0 28
2 23134 82.5869 7.7075 0150054 350.7049 9.1435 15.66339849 3595
1994032E
1 23135U 94032E 94180.61028392 .00391874 40359-4 23403-2 0 21
2 23135 82.5617 7.8686 0176005 345.6439 13.9846 15.59164034 3577
1994032F
1 23136U 94032F 94181.16000247 .01007076 50772-3 15191-2 0 47
2 23136 82.5835 7.2023 0060196 56.1316 304.5784 16.01075726 3667
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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962. Re: help-which radio?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-02 15:59:29 UTC
From: gerry@cs.tamu.edu
Message-ID: <2v42t1$o5o@news.tamu.edu>
Source record: 27263

I'm using the Icom IC-970A (not the -H!) with significant success on AO-10, AO-13, FO-20, AO-21 and AO-27. No problems, except that I'm a little underpowered sometimes. Still in all, it just works fine!

The rest of the station is the Yaesu 5400B rotor and the Cushcraft antennas (used, rebuilt and actually working). I intend to get newer and "better" antennas, but these are adequate for what I wanted initially: Get in cheap and get started (OK, so the -970 wasn't "cheap." The IC251 and -451 were, and constituted the first OSCAR station...). I'm using the Icom mast mounted preamps, although I may rework those over the next year to play with gain and noise figures somewhat.

73, gerry n5jxs
--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

963. ARLK026 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-07-02 20:50:16 UTC
From: w1aw@arrl.org
Message-ID: <$arlk026.1994@ampr.org>
Source record: 27264
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK026
ARLK026 Keplerian data

ZCZC SK93
QST de W1AW
Keplerian Bulletin 26 ARLK026
From ARRL Headquarters
Newington, CT July 2, 1994
To all radio amateurs

SB KEP ARL ARLK026
ARLK026 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 99965U 94189.72594477 .00027158 30948-8 84442-4 0 19
2 99965 28.4683 7.4627 0003452 327.1219 272.8160 15.90322967 17
AO-10
1 14129U 83058B 94176.41110075 -.00000306 00000-0 10000-3 0 2893
2 14129 27.0856 321.0039 6024383 189.2195 150.8337 2.05882336 54986
RS-10/11
1 18129U 87054A 94181.84974492 .00000020 00000-0 55262-5 0 9194
2 18129 82.9240 318.7402 0012176 354.2151 5.8861 13.72338741351782
UO-11
1 14781U 84021B 94181.57779262 .00000067 00000-0 19177-4 0 7040
2 14781 97.7858 195.6756 0010832 224.3911 135.6427 14.69225089552277
RS-12/13
1 21089U 91007A 94182.00061558 .00000037 00000-0 22509-4 0 7042
2 21089 82.9192 1.2005 0030899 70.1466 290.3014 13.74043099170540
AO-13
1 19216U 88051B 94180.17114065 -.00000492 00000-0 10000-4 0 9269
2 19216 57.7928 244.7541 7213733 344.7303 1.9030 2.09725008 14760
UO-14
1 20437U 90005B 94181.17094406 .00000012 00000-0 21666-4 0 61
2 20437 98.5888 265.7706 0011270 148.7156 211.4700 14.29848006231441
AO-16
1 20439U 90005D 94178.21712155 .00000010 00000-0 20978-4 0 8041
2 20439 98.5981 264.1007 0011033 158.0706 202.0949 14.29901614231037
```

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DO-17
1 20440U 90005E 94178.24044877 .00000017 00000-0 23500-4 0 8046
2 20440 98.5990 264.4494 0011506 157.3761 202.7928 14.30041300231055
WO-18
1 20441U 90005F 94181.15467102 .00000001 00000-0 17453-4 0 8077
2 20441 98.5977 267.3273 0012054 149.3828 210.8060 14.30015655231479
LO-19
1 20442U 90005G 94178.75317896 .00000031 00000-0 28776-4 0 8033
2 20442 98.5991 265.2158 0012241 155.8695 204.3055 14.30111899231140
FO-20
1 20480U 90013C 94180.92151497 -.00000010 00000-0 58396-4 0 7015
2 20480 99.0361 330.3349 0540560 310.6901 44.8395 12.83226179205763
AO-21
1 21087U 91006A 94180.84490761 .00000094 00000-0 82657-4 0 4849
2 21087 82.9449 133.3485 0037046 49.6353 310.8027 13.74541737171320
UO-22
1 21575U 91050B 94181.15732371 .00000046 00000-0 30171-4 0 5089
2 21575 98.4344 255.3931 0006801 252.7171 107.3281 14.36921644154947
KO-23
1 22077U 92052B 94181.22418147 -.00000037 00000-0 10000-3 0 4033
2 22077 66.0834 252.6851 0014564 283.4501 76.4893 12.86286916 88461
KO-25
1 22830U 93061H 94179.22798762 .00000022 00000-0 26131-4 0 3060
2 22830 98.5529 252.0960 0012037 140.4552 219.7507 14.28058431 39271
IO-26
1 22826U 93061D 94179.21993428 -.00000003 00000-0 16668-4 0 3019
2 22826 98.6522 254.9542 0008849 173.5876 186.5418 14.27731640 39269
AO-27
1 22825U 93061C 94179.73033811 -.00000001 00000-0 17426-4 0 3017
2 22825 98.6528 255.4221 0008353 170.1806 189.9539 14.27627600 39339
PO-28
1 22829U 93061G 94179.72381534 .00000026 00000-0 28308-4 0 2946
2 22829 98.6491 255.4805 0010222 158.5288 201.6320 14.28031163 39347
Arsene
1 22654U 93031B 94169.23096299 -.00000111 00000-0 00000+0 0 2631
2 22654 1.8748 99.1484 2919067 184.0582 172.2245 1.42202724 1217
Mir
1 16609U 86017A 94181.23244135 .00003287 00000-0 52446-4 0 6599
2 16609 51.6459 121.1314 0003021 97.4905 262.6430 15.56430535478073

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
July 7, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

964. EEK!! Where did archive.afit.af.mil go????

Newsgroup: rec.radio.amateur.space
Date: 1994-07-02 22:53:29 UTC
From: <>
Message-ID: <2v4r59$t0b@wizard.uark.edu>
Source record: 27269

I just tried to ftp to archive.afit.af.mil to get a new set of keplerian elements and IT'S GONE!! "Unknown host". Please tell me the nameserver here is screwy, else tell us all where there is another site (not sight or cite).

Peter Laws <plaws@comp.uark.edu> |"Let's make sure history never forgets the
n5uwy@ka5bml.#nwar.ar.usa.noam | name ... Enterprise" ST:TNG - 1987-1994

965. Graphical Tracking Software

Newsgroup: rec.radio.amateur.space
Date: 1994-07-03 14:14:56 UTC
From: jcw@kd4dts.atl.ga.us
Message-ID: <1994Jul3.141456.9078@kd4dts.atl.ga.us>
Source record: 27268

Not being familiar with any of the tracking software that's available, are there any packages that display the satellites (preferabbly a great many) orbiting with a point of view from, oh say, 20,000 miles up, and about the same out in some direction? Basically a 3D presentation of the positions?

- John
--

John C. Wren (kd4dts) | "The UNIX operating system has a command, NICE,
jcw@kd4dts.atl.ga.us | which allows a user to voluntarily reduce the
..!emory!wa4mei!kd4dts!jcw | priority of his process, in order to be nice to

966. ANS-184 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-07-03 19:13:01 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-184.01.1994@ampr.org>
Source record: 27272
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-184.01
FIELD DAY '94 A SUCCESS!

HR AMSAT NEWS SERVICE BULLETIN 184.01 FROM AMSAT HQ
SILVER SPRING, MD JULY 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-184.01

'94 Field Day Operations Considered A Major Successs

Field Day '94, June 25-26th, proved once again that satellite stations and contacts are considered to be an important part of Field Day (FD) planning. Although only a few reports have started to trickle in, it is clear by listening to the downlink passbands that Field Day enthusiasts had more on their minds than making the one "perfunctory" contact to earn the 100 bonus points. They were on the "birds" to make points for their stations. The passbands on every OSCAR were jammed with stations calling "CQ FD." Below are some of the FD reports that have shown up on INTERNET and at AMSAT-NA HQ:

N6DD operated his FD station from his 29' long houseboat on the Colorado River 65 miles south-east of Las Vegas, NV. His yagi antennas were mounted atop his houseboat and were steered using the "armstrong" method. Although it was quite hot, about 120 degrees F (50 degrees C), and winds picking up right at AOS for some of the LEO OSCARs, N6DD was able to make 65 contacts with most of them coming from AO-10. N6DD says that he wished they had made more contacts but they were please with their satellite contacts in general. N6DD operated as class 2C NV. Next year he says that they will investigate an automatic antenna pointing system. Their station consisted of station setup KLM crossed yagis on VHF and UHF, a homebrew 2 element 10M beam on the elevation boom, a FT-736R + twin Mirages, and for 10M a Kenwood TS-130.

Field Day '94 for W0TWU was an adventure, he reports. Although he didn't expect to be operating with temperatures of 107 degrees F, it was, however, a good test to see if both the equipment and operators could survive! From Central Kansas they worked 298 stations on AO-10 and 301 stations on AO-13! They tried to work FO-20 but found they had a desense problem. Next year W0TWU says he plans to try Mode-S on FD.

N2NRD operated clase 1E from his back yard with his antennas mounted on a tripod to support his KLM-40CX & KLM-22C atenna combination. Although his "line-of-sight" was blocked at low elevations by his house, this caused only minor problems during N2NRD's FD effort. N2NRD's station equipment used: ICOM 271H/471H, KLM 40CX/22C, Kenpro 5400 antenna rotator combina-

tion, ICOM preamp, 70cm TE amp, Astron VS-50M power supply, Kenwood TS-830 and a 29MHz vertical/dipole HF antenna combination. N2NRD made over 250 contacts! One surprise of this FD was AO-10. N2NRD reports that AO-10 "was the best I have heard it in years. At apogee the signals were strong with very little fading. Perigee had AO-10 pass over-head at high elevations with very strong signals making for a good QSO run." N2NRD's plans for next year include operating the same sation setup but from a location that provieds an excellent view of horizon in all directions. Also, he plans to spend more time operating CW and get on the digital birds!

The FD satellite station at WM5U, the Lockheed Radio Club in Fort Worth, TX was part of a 2A NTX operation. Satellite availability was better than the operators of WM5U thought it would be. A new antenna setup provided them with a lot of technical problems which caused them to miss the first AO-13 window completely. The heat combined with a lack of operators made operating difficult on Saturday afternoon. But they managed a bit of a come back over the remainder of the contest period. Results were a bit disappointing because they were striving to make alest 100 QSOs. They came up a bit short with a total of 94 QSOs. WM5U made 33 CW contacts and 61 voice contacts using all the available OSCARs. Their station consisted of the following equipement: Yaesu FT-736R, a Kenwood TS-140S, Landwehr Pre-Amps, Mirage B-1016G & D-1010 power amplifiers, KLM 22C & 40CX (on a 15' Create Roof Tower) with a Yaesu G-5400B w/KC Tracker/Tuner, a DSP-12, and finally a 386SX-16 IBM PC. The operators doubt that they'll rank very well in the AMSAT competition this year but do note that it was fun anyway!

The above FD '94 reports are just a few of the summaries of from the stations that operated the OSCARs under FD conditions. But they indicate that a great deal of effort went into setting up and operating the OSCARs during FD '94. AMSAT congratulates all those who worked the birds during FD '94 and looks forward to seeing more hams on the birds in FD '95.

[The AMSAT News Service (ANS) would like to thank N6DD, W0TWU, and KG5OA for these FD '94 reports.]

/EX
SB SAT @ AMSAT $ANS-184.02
HOUSTON AMSAT NET VIA SATELLITE

HR AMSAT NEWS SERVICE BULLETIN 184.02 FROM AMSAT HQ
SILVER SPRING, MD JULY 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-184.02

Local Houston Area AMSAT Net Can Be Heard Throughout the North America

Houston AMSAT Net originates live from Houston, TX on Tuesdays nights at 10:00 PM Central Time on 147.100 and is carried Live on Galaxy 3, Transponder 17, 5.8Mhz Audio Subcarrier

ATTENTION Satellite Enthusiasts: Want more up to date information on what his happening in the satellite world and other on neat stuff? AMSAT News Service bulletins, Space News, NASA news, Hints & Tips on working satell-

ites and much more is available every week on the Houston AMSAT Net.

The following repeater operators carry the net live or rebroadcast it at a more convienent time. If you like the net, let your repeater trustee know. They go through a lot of trouble to bring you our net so thank them. If your local repeater does not carry our net, ask the trustee if they would.

NETARC - New England
WA1PBJ 448.225 - 88.5 Sargents Pur, NH (White Mountains)
WA1PBJ 446.575 - 88.5 Boston, MA
KC1HF 448.225 - 88.5 Framingham, MA
WA1PBJ 442.000 + 88.5 Fitchburg, MA
K1MON 442.600 + 88.5 Portland, ME

Southern Wisconsin Repeater Group
N9KAN 443.400 Madison, WI
KD9UU 443.675 North Freedom, WI
AA9AD 53.090 Fort Atkinson, WI

Other Repeaters and Frequencies (Alphabetized by State then City)
NL7H 147.000 Anchorage, AK
KL7FZ 444.950 Anchorage, AK
WL7AML 439.250 Kodiak, AK Audio on ATV Repeater
NO6B 224.040 Pasadena, CA
N6DD 447.650 Upland, CA
WA4HX 146.880 Lakeworth, FL (West Palm Beach Area)
AJ1R 145.230 Tampa, FL
AJ1R 443.625 103.5 Tampa, FL
WB9YCZ 147.390 Noblesville, IN (N. Indianapolis)
WB9YCZ 444.125 Noblesville, IN (N. Indianapolis)
N0PMZ 146.570 Simplex Garden City, KS
KA0PQW 223.940 Chaska, MN (Minneapolis/St. Paul Area)
WB0BWL 145.210 Columbia Heights, MN (Minneapolis Area)
WA0RCR 1.860 160 Mtrs Wentzville, MO
WA0ZOK 146.715 Horace, ND
443.750 Horace, ND
KB7BY 1.2G ATV Repeater Las Vegas, NV
KD8XB 146.805 Lisbon, OH
W0KIE 88.5 FM Tulsa, OK (Tulsa Cablevision)
VE3SF 145.230 Toronto, Ontario Canada

Compiled by: Marty Smith - WD5DZC & Bruce Paige - KB5ZRV
Check-in, questions, querys, comments during the net? Call us:
Marty Smith WD5DZC (713) 467-9870
Bruce Paige KB5ZRV (713) 933-0488

For Additions, Corrections, or Suggestions after the net?
Marty Smith WD5DZC (713) 467-9870 (Voice Message)
Bruce Paige KB5ZRV Internet: KB5ZRV@AMSAT.ORG or Packet: KB5ZRV@F6CNB

Please let us know if you are repeating our net so we can add your
repeater to this list.

[The AMSAT News Service (ANS) would like to thank WD5DZC and KB5ZRV for
this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-184.04
STS-65 SAREX READY FOR LAUNCH!

HR AMSAT NEWS SERVICE BULLETIN 184.04 FROM AMSAT HQ
SILVER SPRING, MD JULY 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-184.04

STS-65 SAREX Mission Planned Launch of 08-JULY-94 Still On Schedule

The next Space Shuttle mission, with the Shuttle Amateur Radio Experiment
(SAREX) payload on-board, is currently slated for launch this Friday July 8
at 16:43 UTC. Note that this launch time is 23 minutes earlier than what has
been reported previously. The STS-65 Space Shuttle Columbia mision will
carry Amateur Radio operators Don Thomas, KC5FVF and Bob Cabana (license
pending) into a 28.5 degree inclination orbit for a 14 day mission. The
primary objective of this flight is to perform microgravity research
as part of the International Microgravity Laboratory (IML-02) mission.

Thirteen schools from the U.S., Japan, and Germany have scheduled ham radio
contacts with the astronauts. Ten of these school group contacts will be
performed using AMSAT's worldwide network of telebridge stations. The tele-
bridge allows students to talk to the Astronauts through a remote ground
station that is linked to the school though a phone bridge. The Goddard
Amateur Radio Club, WA3NAN expects to retransmit some of these school contacts
as part of their Shuttle Transmission activities. A limited number of schools
who wish to "easedrop" on the STS-65 school group contacts via a listen only
phone connection are encouraged to send e-mail to Frank Bauer, KA3HDO, with
your request. Your request should incluude an explanation of how you are going
to use this listen only dialog in your classroom setting. Mr. Bauer's e-mail
address is ka3hdo@amsat.org.

A detailed fact sheet, follows:

STS-65 Shuttle Amateur Radio Experiment (SAREX)
Information Sheet

Mission: STS-65 Space Shuttle Columbia
International Microgravity Mission (IML-02)

Launch: July 8, 1994, 16:43 UTC

Orbit: 28.45 degree inclination

Mission Length: 14 days (Nominal)

Amateur
Radio

Operators: Donald A. Thomas, KC5FVF, and Robert D. Cabana, License Pending

Modes:FM Voice
Callsign: KC5FVF

Packet Radio
Callsign: W5RRR-1

Frequencies: All operations in split mode. Do not transmit on the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks : 144.91, 144.93, 144.95, 144.97, 144.99 MHz (Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: The crew will not favor any specific uplink frequency, so your ability to work the crew will be the "luck of the draw"

Packet Freqs: Downlink: 145.55 MHz
Uplink : 144.49 MHz

Info:Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland,
SAREX Bulletins and Shuttle Retransmissions
3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz
and 147.45 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT
SAREX News Bulletins 3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz
and 147.555 MHz (FM)

Also, bulletins available on internet, via AMSAT ANS, Compuserve, and your local PBSS.

School Group Participation: 13 school groups will participate in SAREX with pre-scheduled direct and telebridge contacts. These include 11 in the U.S., and one in Germany and one in Japan.

Prelaunch Keplerian Elements:

The following represents the Keplerian Elements for a 16:43 UTC launch time. Please note that this is 17 minutes earlier that what was originally published for the launch time. Updates will be provided later in the week. These Keps are provided by Gil Carman, WA5NOM at the Johnson Space Center ARC:

STS-65 OMS-2
1 99965U 94189.72594477 .00027158 30948-8 84442-4 0 19
2 99965 28.4683 7.4627 0003452 327.1219 272.8160 15.90322967 17

Satellite: STS-65
Catalog number: 00065
Epoch time: 94189.72594477 = (08-JUL-94 18:18:30.18 UTC)
Element set: 003
Inclination: 28.4683 deg
RA of node: 7.4627 deg Space Shuttle Flight STS-65

Eccentricity: .0003452 Prelaunch Element set JSC-003
Arg of perigee: 327.1219 deg Launch: 08-JUL-94 16:43:00 UTC
Mean anomaly: 272.8160 deg
Mean motion: 15.90322967 rev/day Gil Carman, WA5NOM
Decay rate: 2.7158e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 17

[The AMSAT News Service (ANS) would like to thank the ARRL and the SAREX Working Group for this information.]

/EX
SB SAT @ AMSAT $ANS-184.05
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 184.05 FROM AMSAT HQ
SILVER SPRING, MD JULY 2, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-184.05

Weekly OSCAR Status Reports: 02-JUL-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11
[G3RUH/DB2OS/VK5AGR]

MIR: A Soyuz-TM 19 was launch last Friday July 1, 1994 at 12:25 UTC from Baikonur, Kazajstan to MIR space station, carring a Russian cosmonaut, Yuri Malentchenco and Talgat Moussabaiev from Kazajstan. During the next 48 hours will be orbiting Earth and then Sunday they'll dock with MIR. During the docking maneuvers probably the amateur rig will turn off. [LW2DTZ]

DO-17: DO-17 still continues to transmit its voice message on a downlink frequency of 145.825 MHz.

FO-20: The analog transponder provides excellent signals on the passband. Listen for the CW beacon on 435.795 MHz. [WD0HHU]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ W0GVT. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of

value to all OSCAR enthusiasts.

/EX

967. Re: EEK!! Where did archive.afit.af.mil go????

Newsgroup: rec.radio.amateur.space
Date: 1994-07-04 09:40:36 UTC
From: brent@network.ucsd.edu
Message-ID: <2v8lek$bcn@network.ucsd.edu>
Source record: 27270

In article <2v4r59$t0b@wizard.uark.edu> plaws@comp..uark.edu (Peter Laws) writes:
>I just tried to ftp to archive.afit.af.mil to get a new set of keplerian
>elements and IT'S GONE!! "Unknown host".

This is common, especially on weekends. Just wait a few hours or days
and try again. Not to worry.

You can also get elements by telnetting (not FTP) to the raidbbs at
raidbbs.gsfc.nasa.gov Login is "raid" and password is "goddard1". You
then follow the instructions... The interface is your typical cheezy
BBS, so there is a price to pay, mainly in the time it takes to get
element sets off of it. But, on the good side, they are the most recent
elements you will find, usually a day or two fresher than on
archive.afit.af.mil

Brent

968. Re: Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-07-04 15:26:45 UTC
From: kupiec@tigger.jvnc.net
Message-ID: <1994Jul4.152645.12448@tigger.jvnc.net>
Source record: 27271

In <2utve8$l2k@mercury.king.ac.uk>, niall@crystal.king.ac.uk writes:
>This post is a follow-up to my post last week about a satellite tracking system
>which I am hoping to write in C for my final year project.

So far, the ONLY real-time satellite tracker that I've found for UNIX
(in C) is Manfred Bester's SatTrack.

Version 1.7 (the latest) is available for ftp at ftp.jvnc.net in
/priv/kupiec/sattrack. You might want to look at that for help.

Good Luck.
--
Bob Kupiec (HAM: N3MML) Phone: 609-897-7319 JvNC (GES, Inc.)
Network Operations & 800-35-TIGER x7319 3 Independence Way
Email: kupiec@jvnc.net Fax : 609-897-7310 Princeton, NJ 08540

969. Sat Logging

Newsgroup: rec.radio.amateur.space
Date: 1994-07-05 22:11:53 UTC
From: koechig@garnet.msen.com
Message-ID: <2vclr9$2b6$2@heifetz.msen.com>
Source record: 27273

Just out of curiosity is there a right way and wrong way when it comes to logging satellite qsos? Is the tx freq used for the record?

Thanks

Bill Koechig, N8PKA

970. KLM vs. M2 antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-05 23:41:52 UTC
From: Wayne_Estes@csg.mot.COM
Message-ID: <9407051841.ZM29483@SALCIUS2>
Source record: 27274

I am about to put up Oscar antennas on my roof. I have tentatively ruled out the KLM 22C antenna because the boom is so long. I would prefer to use either the small KLM's, or the M2 antennas which are 16 elements on VHF, 30 elements on UHF.

I would appreciate anybody's comments:

1. Comparison of small KLM (14 el. on VHF) vs. M2 antennas (16 el. on VHF) ? (gain, mechanical construction, weather problems, polarity relays, etc.)
2. Is a closet rod an acceptable substitute for a fiberglass crossboom ? If so, is polyurethane an acceptable sealant ?
3. Best weatherproof VHF preamp that can handle 50+ watts ?

Please respond to the newsgroup or direct to wayne@csg.mot.com

73 de Wayne Estes, WD5FFH, Mundelein, IL

971. Re: Sat Logging

Newsgroup: rec.radio.amateur.space
Date: 1994-07-06 15:05:22 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Jul6.150522.28206@gov.nt.ca>
Source record: 27275

In article <2vclr9$2b6$2@heifetz.msen.com> koechig@garnet.msen.com (B Koechig) writes:
>
Just out of curiosity is there a right way and wrong way when it comes to
>logging satellite qsos? Is the tx freq used for the record?
>
Thanks
>
Bill Koechig, N8PKA
>
IMHO, satellite transponder passbands are small enough that logging
of the transponder mode and operating mode (ie. B/SSB, J/FM, etc.)
and the satellite is more than adequate for any logging, QSLing and
record keeping requirements. In my log and on cards under the
'FREQ' column I put the satellite name and under 'MODE' the operating
modes as above.
73
==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

972. Looking for STSORBIT (*not* Plus)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-06 18:31:57 UTC
From: ahm@hogpd.ho.att.com
Message-ID: <CsJ7HA.MLE@nntpa.cb.att.com>
Source record: 27277

Can anyone tell me where I can find STSORBIT via ftp?

I already have STSORBIT PLUS, and it's amazing.
However, my machine doesn't have the required math coprocessor, so it's
painfully slow.

Thanks,
Andy, N2FYE
--
==--
-=======--- Andreas Meyer, N2FYE ahm@hogpa.att.com
--==----- AT&T Bell Laboratories, Holmdel NJ ..!att!hogpa!ahm
----

973. 10M receive antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-06 18:59:08 UTC
From: Gary_Rogers@DGC.ceo.dg.COM
Message-ID: <9407061959.AI00035@rtp41.rtp.dg.com>
Source record: 27276

Message:
Well, I finally did it! Last Thursday I made my first satellite contact via RS-10. Yee-Haaa!! as they say. Other than chasing myself all over the place due to doppler and not keeping my transmissions brief, it really wasn't bad at all. After putting things off for years, I really enjoyed myself. (Those comments for any readers who have yet to actually take the plunge. Don't put it off!) One problem, though, and a question. First, the problem: I was using an R-7 for the down-link antenna, but noticed that if I switched to the 20-75 trap dipole the signal might improve. Going back and forth between antennas allowed me to keep contact. That got me to wondering, though, if some other arrangement might work better. What about crossed Yagis, fed with a 1/4 section? Maybe over a ground plane? If this arrangement has merit, what lengths and spacings would be optimal? Could I get a pattern similar to the Egg-beater I'm using on 2M? Now the question: Is the down-link from RS-10 weaker than from RS-12 or is it just my imagination? Thanks in advance.

Gary Rogers WA4YMZ E-mail: Gary Rogers@dgc.ceo.dg.com
P.S. I may work for Data General, but these opinions are my own 'cause no own else will claim them.

974. ARLS024 SAREX QSL cards

Newsgroup: rec.radio.amateur.space
Date: 1994-07-06 21:45:00 UTC
From: w1aw@arrl.org
Message-ID: <$arls024.1994@ampr.org>
Source record: 27279
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS024
ARLS024 SAREX QSL cards

ZCZC AS68
QST de W1AW
Space Bulletin 024 ARLS024
From ARRL Headquarters
Newington, CT July 6, 1994
To all radio amateurs

SB SPACE ARL ARLS024
ARLS024 SAREX QSL cards

SAREX QSL Cards

Reports and QSLs for the upcoming Shuttle Amateur Radio EXperiment mission should be sent to ARRL EAD, STS-65 QSL, 225 Main Street, Newington, CT 06111, USA.

In order for the managing process to run smoothly, please include the following information with your report or QSL: Shuttle flight number (STS-65), date, time in UTC, frequency and mode (FM voice or packet). In addition, you must also include an SASE using a large, business-sized envelope if you wish to receive a card. No cards are distributed without the proper postage affixed or sufficient IRCs included.

Cards often take many months to produce because of printing delays and the busy schedules of the astronauts, who often help design their QSL cards. Once the cards are completed, they are forwarded to whichever Amateur Radio club is involved with the awesome task of managing the cards. The following clubs have graciously volunteered their service for handling QSL cards for the following missions:
STS-58 Connecticut DX Association
STS-60 Cowley County Amateur Radio Club, Kansas
STS-59 Orange Park Amateur Radio Club, Florida
STS-65 Lake County Amateur Radio Club, Indiana
NNNN
/EX

975. ARLS025 New Astronaut Hams

Newsgroup: rec.radio.amateur.space
Date: 1994-07-06 21:46:18 UTC
From: w1aw@arrl.org
Message-ID: <$arls025.1994@ampr.org>
Source record: 27280
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS025
ARLS025 New Astronaut Hams

ZCZC AS69
QST de W1AW
Space Bulletin 025 ARLS025
From ARRL Headquarters
Newington, CT July 6, 1994
To all radio amateurs

SB SPACE ARL ARLS025
ARLS025 New Astronaut Hams

New Astronaut Hams

Shuttle Missions To Carry New Astronaut-Hams.
Launch Scheduled for July 8.

The Amateur Radio community has three new astronaut-hams among their ranks. The FCC has recently issued call signs for Robert D. Cabana, KC5HBV, L. Blaine Hammond Jr, KC5HBS and Jerry M. Linenger, KC5HBR. Cabana will serve as Commander on the Space Shuttle Columbia which is scheduled to launch this Friday, July 8, at 1643 UTC. The mission has been designated STS-65. Hammond and Linenger will fly aboard the Shuttle Discovery during STS-64 in September.

When Columbia launches this week, it will carry the second International Microgravity Laboratory (IML-02) and the Shuttle Amateur Radio EXperiment (SAREX) payload. Cabana and Mission Specialist Donald Thomas, KC5FVF will lead the Amateur Radio activities, which will include random QSO opportunities with the general ham radio community and specially selected schools around the world.

SAREX will be flown in configuration C, which includes 2-meter FM voice and packet radio hardware. The crew will use separate receive and transmit frequencies. Earth stations should listen to the downlink frequency and transmit on the uplink frequency only when the Shuttle is in range and the astronauts are on the air. The worldwide voice and packet downlink frequency is 145.55 MHz. Please do not transmit on this frequency. The voice uplink frequencies are 144.91, 144.93, 144.95, 144.97 and 144.99 MHz. In Europe, the voice uplink frequencies are 144.70, 144.75, and 144.80 MHz. The worldwide packet uplink frequency is 144.49 MHz. Look for KC5FVF and KC5HBV on voice, and W5RRR-1 on packet which the crew may

operate in an attended or unattended mode.

The following pre-launch Keplerian elements are based upon a launch
at 1643 UTC on Friday, July 8:

STS-65
1 00065U 94189.74687707 .00052344 00000-0 15762-3 0 47
2 00065 28.4664 7.3074 0003571 330.7493 29.2906 15.90324781 29

Satellite: STS-65
Catalog number: 00065
Epoch time: 94189.74687707 = (08 JUL 94 17:55:30.18 UTC)
Element set: 004
Inclination: 28.4664 deg
RA of node: 7.3074 deg Space Shuttle Flight STS-65
Eccentricity: .0003571 Prelaunch Element set JSC-004
Arg of perigee: 330.7493 deg Launch: 08 JUL 94 16:43 UTC
Mean anomaly: 29.2906 deg
Mean motion: 15.90324781 rev/day Gil Carman, WA5NOM
Decay rate: 5.2344e-04 rev/day sq NASA Johnson Space Center
Epoch rev: 2
Checksum: 295
NNNN
/EX

976. DOVE Confusion, Need Clarification

Newsgroup: rec.radio.amateur.space
Date: 1994-07-06 23:32:35 UTC
From: jcw@kd4dts.atl.ga.us
Message-ID: <1994Jul6.233235.19336@kd4dts.atl.ga.us>
Source record: 27278

I'm a little confused about the DOVE satellites (so what's new many people shout together...) Is DO-17 the DOVE satellite? And what modes, etc does it support? I'm trying to find the TLE's to add to PCTRACK, and I'm not sure what I'm looking for. Someone recently posted a large list of TLE, and the closest thing I find is DO-17.

- John
--

John C. Wren (kd4dts) | "The UNIX operating system has a command, NICE,
jcw@kd4dts.atl.ga.us | which allows a user to voluntarily reduce the
..!emory!wa4mei!kd4dts!jcw | priority of his process, in order to be nice to

977. rebroadcast of AMSAT net

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 13:23:43 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940707132343@kendurham.sc.ti.com>
Source record: 27287

A recent AMSAT bulletin listed a live rebroadcast of the Houston AMSAT net to take place on television satellite G3 transponder 17, 5.8 Mhz audio channel at 10:00 PM last Tuesday night. I couldn't find any audio on 5.8 or anywhere else on transponder 17. Messages left at the phone numbers listed in the bulletin for information have not resulted in any return calls.

Does anyone know if the rebroadcast was on another sat, freq, or time?

K5MBV

978. 10M Receive Antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 14:09:34 UTC
From: Gary_Rogers@DGC.ceo.dg.COM
Message-ID: <9407071509.AJ00017@rtp41.rtp.dg.com>
Source record: 27281

Message:
OOPS!! In my previous posting, H-S Digest #179, I made mention of crossed Yagis. I really meant "crossed dipoles". If I had the ability to put up beams, I wouldn't have the need for a fixed antenna. I found something about this configuration in an old copy of The Satellite Experimenters Handbook with the name T/R Array (for turnstile-reflector) The diagram showed two patterns, one like a slightly elevated do-nut and the other more rounded but slightly elongated in the vertical plane with the difference being only the spacing above ground. The do-nut was 3/8 wave and the other was 1/4 wave above. Also, the antenna was illustrated for 2M, but shouldn't it work for other bands as well? Again, thanks in advance for any input.

73, Gary WA4YMZ FM05 Apex,NC E-mail: Gary Rogers@dgc.ceo.dg.com

Any opinions expressed are my own, and don't reflect those of any other party. Thier loss.

979. DOVE-OSCAR-17 Telemetry Decoding Program Available

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 14:11:31 UTC
From: magliaco@pilot.njin.net
Message-ID: <Jul.7.10.11.29.1994.28946@pilot.njin.net>
Source record: 27282

I just finished creating a simple (but effective) telemetry decoding program for DOVE-OSCAR-17 and am making it available via anonymous FTP at pilot.njin.net. The file is called "duvdec10.zip" and is located in the /pub/SpaceNews/software sub-directory.

73, de John, KD2BD

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..
--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

980. Re: DOVE Confusion, Need Clarification

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 16:00:28 UTC
From: rspear@sookit
Message-ID: <2vh8qs$66h@netline-fddi.jpl.nasa.gov>
Source record: 27283

John C. Wren (jcw@kd4dts.atl.ga.us) wrote:
: I'm a little confused about the DOVE satellites (so what's new many
: people shout together...) Is DO-17 the DOVE satellite? And what
: modes, etc does it support? I'm trying to find the TLE's to add to
: PCTRACK, and I'm not sure what I'm looking for. Someone recently
: posted a large list of TLE, and the closest thing I find is DO-17.

: - John

john - here's the downlinks from dove (do-17) ...

145.82438 1200 bps AFSK FM or Dig Voice
145.82516 1200 bps AFSK FM or Dig Voice

there are no uplinks ...

regards, richard kd6lwd

rspear@sookit.jpl.nasa.gov
all disclaimers apply

981. STS-65 Element Set (94189.746)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 16:46:16 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94189.746@alsys.com>
Source record: 27284
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 00065U 94189.74687707 .00052344 00000-0 15762-3 0 47
2 00065 28.4664 7.3074 0003571 330.7493 29.2906 15.90324781 29

Satellite: STS-65
Catalog number: 00065
Epoch time: 94189.74687707 = (08 JUL 94 17:55:30.18 UTC)
Element set: 004
Inclination: 28.4664 deg
RA of node: 7.3074 deg Space Shuttle Flight STS-65
Eccentricity: .0003571 Prelaunch Element set JSC-004
Arg of perigee: 330.7493 deg Launch: 08 JUL 94 16:43 UTC
Mean anomaly: 29.2906 deg
Mean motion: 15.90324781 rev/day Gil Carman, WA5NOM
Decay rate: 5.2344e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 2

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

982. Re: DOVE Confusion, Need Clarification

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 19:00:06 UTC
From: ned_stearns@email.mot.com
Message-ID: <1994Jul7.190006.6947@schbbs.mot.com>
Source record: 27285

In article <1994Jul6.233235.19336@kd4dts.atl.ga.us>, jcw@kd4dts.atl.ga.us (John C. Wren) says:
>
> I'm a little confused about the DOVE satellites (so what's new many
> people shout together...) Is DO-17 the DOVE satellite? And what
> modes, etc does it support? I'm trying to find the TLE's to add to
> PCTRACK, and I'm not sure what I'm looking for. Someone recently
> posted a large list of TLE, and the closest thing I find is DO-17.
>
> - John

Yes, DO-17 is the same satellite as DOVE. At the moment, the bird is transmitting on 145.825 +/- doppler. It is broadcasting AFSK 1200 baud packet (standard TNC will capture and decode) and computer generated voice announcements. At this time, the computer generated voice is simply saying "HI, this is DOVE in space" or something like that. A little difficult to understand. Good luck.

Ned AA7A

983. oscar rigs, etc.

Newsgroup: rec.radio.amateur.space
Date: 1994-07-07 22:40:53 UTC
From: rspear@sookit
Message-ID: <2vi09l$cda@netline-fddi.jpl.nasa.gov>
Source record: 27286

i'm trying to put together a first sat station ... right now i just use a 2 meter mobile rig, power supply and 3 element beam. i know about 726's and 736's, but i would like to enter the hobby at a less expensive level. seems that there are 2 meter and 430 mhz multimodes that were used for sat comm before the fancy newer rigs ... anyone have suggestions for entry level stuff?

regards, richard

rspear@sookit.jpl.nasa.gov
all disclaimers apply

984. Satellites seen fron Earth

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 02:48:06 UTC
From: stjacque@nbnet.nb.ca
Message-ID: <stjacque.58.0@nbnet.nb.ca>
Source record: 27288

Hi,
I am an amateur astronomer and often wondered if it was possible to identify the satellites crossing the night sky. If anyone knows, I guess you guys should know.
So, would anyone be so kind and send me the coordinates, dates, times...
I am at long.68*26, lat.+47*28.
I will appreciate very much.
Thanks.
Rachel

985. ORBS$189.OSCAR.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 04:33:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-189.o.1994@ampr.org>
Source record: 27289
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-189.O
Orbital Elements 189.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX July 8, 1994
BID: $ORBS-189.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94176.41110075
Element set: 289
Inclination: 27.0856 deg
RA of node: 321.0039 deg
Eccentricity: 0.6024383
Arg of perigee: 189.2195 deg
Mean anomaly: 150.8337 deg
Mean motion: 2.05882336 rev/day
Decay rate: -3.06e-06 rev/day^2
Epoch rev: 8295
Checksum: 298

Satellite: UO-11
Catalog number: 14781
Epoch time: 94186.07267686
Element set: 705
Inclination: 97.7857 deg
RA of node: 199.9598 deg
Eccentricity: 0.0010908
Arg of perigee: 209.5355 deg
Mean anomaly: 150.5234 deg
Mean motion: 14.69226745 rev/day
Decay rate: 1.22e-06 rev/day^2
Epoch rev: 55293
Checksum: 350

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94187.82828537
Element set: 924
Inclination: 82.9250 deg
RA of node: 314.3214 deg
Eccentricity: 0.0011550
Arg of perigee: 338.1080 deg
```

Mean anomaly: 21.9579 deg
Mean motion: 13.72339007 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 35260
Checksum: 291

Satellite: AO-13
Catalog number: 19216
Epoch time: 94180.17114065
Element set: 926
Inclination: 57.7928 deg
RA of node: 244.7541 deg
Eccentricity: 0.7213733
Arg of perigee: 344.7303 deg
Mean anomaly: 1.9030 deg
Mean motion: 2.09725008 rev/day
Decay rate: -4.92e-06 rev/day^2
Epoch rev: 4626
Checksum: 292

Satellite: FO-20
Catalog number: 20480
Epoch time: 94184.97566234
Element set: 703
Inclination: 99.0371 deg
RA of node: 333.6238 deg
Eccentricity: 0.0540509
Arg of perigee: 301.5076 deg
Mean anomaly: 53.4288 deg
Mean motion: 12.83226012 rev/day
Decay rate: -2.0e-07 rev/day^2
Epoch rev: 20628
Checksum: 285

Satellite: AO-21
Catalog number: 21087
Epoch time: 94187.32341330
Element set: 486
Inclination: 82.9440 deg
RA of node: 128.5539 deg
Eccentricity: 0.0037000
Arg of perigee: 31.5792 deg
Mean anomaly: 328.7574 deg
Mean motion: 13.74542337 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 17221
Checksum: 296

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94186.51538083

Element set: 705
Inclination: 82.9194 deg
RA of node: 357.8515 deg
Eccentricity: 0.0030918
Arg of perigee: 58.0299 deg
Mean anomaly: 302.3847 deg
Mean motion: 13.74043103 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 17116
Checksum: 309

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94169.23096299
Element set: 263
Inclination: 1.8748 deg
RA of node: 99.1484 deg
Eccentricity: 0.2919067
Arg of perigee: 184.0582 deg
Mean anomaly: 172.2245 deg
Mean motion: 1.42202724 rev/day
Decay rate: -1.11e-06 rev/day^2
Epoch rev: 121
Checksum: 288

/EX

986. ORBS$189.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 04:36:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-189.d.1994@ampr.org>
Source record: 27290
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-189.D
Orbital Elements 189.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX July 8, 1994
BID: $ORBS-189.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94185.22963909
Element set: 7
Inclination: 98.5890 deg
RA of node: 269.7744 deg
Eccentricity: 0.0011398
Arg of perigee: 136.9991 deg
Mean anomaly: 223.2086 deg
Mean motion: 14.29848391 rev/day
Decay rate: 9.0e-08 rev/day^2
Epoch rev: 23202
Checksum: 335

Satellite: AO-16
Catalog number: 20439
Epoch time: 94187.10391636
Element set: 806
Inclination: 98.5965 deg
RA of node: 272.8750 deg
Eccentricity: 0.0011799
Arg of perigee: 132.7023 deg
Mean anomaly: 227.5147 deg
Mean motion: 14.29902664 rev/day
Decay rate: 1.6e-07 rev/day^2
Epoch rev: 23230
Checksum: 314

Satellite: DO-17
Catalog number: 20440
Epoch time: 94186.77654850
Element set: 806
Inclination: 98.5979 deg
RA of node: 272.8817 deg
Eccentricity: 0.0011862
Arg of perigee: 132.7562 deg
```

Mean anomaly: 227.4620 deg
Mean motion: 14.30042144 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 23227
Checksum: 306

Satellite: WO-18
Catalog number: 20441
Epoch time: 94185.21288967
Element set: 808
Inclination: 98.5985 deg
RA of node: 271.3372 deg
Eccentricity: 0.0012255
Arg of perigee: 137.8043 deg
Mean anomaly: 222.4091 deg
Mean motion: 14.30016126 rev/day
Decay rate: 8.0e-08 rev/day^2
Epoch rev: 23205
Checksum: 292

Satellite: LO-19
Catalog number: 20442
Epoch time: 94187.77859823
Element set: 805
Inclination: 98.5996 deg
RA of node: 274.1338 deg
Eccentricity: 0.0012634
Arg of perigee: 129.7145 deg
Mean anomaly: 230.5152 deg
Mean motion: 14.30112885 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 23243
Checksum: 316

Satellite: UO-22
Catalog number: 21575
Epoch time: 94185.75312930
Element set: 509
Inclination: 98.4342 deg
RA of node: 259.8954 deg
Eccentricity: 0.0006811
Arg of perigee: 235.8685 deg
Mean anomaly: 124.1854 deg
Mean motion: 14.36921919 rev/day
Decay rate: 6.0e-08 rev/day^2
Epoch rev: 15560
Checksum: 325

Satellite: KO-23
Catalog number: 22077
Epoch time: 94185.26723086

Element set: 404
Inclination: 66.0823 deg
RA of node: 244.2195 deg
Eccentricity: 0.0014697
Arg of perigee: 282.7245 deg
Mean anomaly: 77.2124 deg
Mean motion: 12.86287015 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 8898
Checksum: 319

Satellite: AO-27
Catalog number: 22825
Epoch time: 94184.21585282
Element set: 302
Inclination: 98.6529 deg
RA of node: 259.8634 deg
Eccentricity: 0.0008610
Arg of perigee: 156.8774 deg
Mean anomaly: 203.2792 deg
Mean motion: 14.27628007 rev/day
Decay rate: .00000000 rev/day^2
Epoch rev: 3997
Checksum: 314

Satellite: IO-26
Catalog number: 22826
Epoch time: 94188.19029709
Element set: 303
Inclination: 98.6524 deg
RA of node: 263.8369 deg
Eccentricity: 0.0009331
Arg of perigee: 147.0437 deg
Mean anomaly: 213.1333 deg
Mean motion: 14.27732719 rev/day
Decay rate: 8.0e-08 rev/day^2
Epoch rev: 4054
Checksum: 306

Satellite: KO-25
Catalog number: 22830
Epoch time: 94188.19631415
Element set: 308
Inclination: 98.5532 deg
RA of node: 260.8802 deg
Eccentricity: 0.0012308
Arg of perigee: 115.3619 deg
Mean anomaly: 244.8834 deg
Mean motion: 14.28059134 rev/day
Decay rate: -1.5e-07 rev/day^2
Epoch rev: 4055

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Checksum: 293

/EX
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987. ORBS$189.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 04:40:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-189.w.1994@ampr.org>
Source record: 27291
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-189.W
Orbital Elements 189.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX July 8, 1994
BID: $ORBS-189.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94187.77737331
Element set: 865
Inclination: 99.0518 deg
RA of node: 238.4969 deg
Eccentricity: 0.0015025
Arg of perigee: 160.4623 deg
Mean anomaly: 199.7124 deg
Mean motion: 14.13625911 rev/day
Decay rate: 1.5e-07 rev/day^2
Epoch rev: 49311
Checksum: 323

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94187.88940346
Element set: 763
Inclination: 98.5087 deg
RA of node: 196.2905 deg
Eccentricity: 0.0012101
Arg of perigee: 273.9586 deg
Mean anomaly: 86.0210 deg
Mean motion: 14.24895287 rev/day
Decay rate: 7.1e-07 rev/day^2
Epoch rev: 40541
Checksum: 333

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94187.24254063
Element set: 329
Inclination: 82.5409 deg
RA of node: 253.4248 deg
Eccentricity: 0.0017610
Arg of perigee: 122.8796 deg
```

Mean anomaly: 237.4058 deg
Mean motion: 13.84718051 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 32499
Checksum: 315

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94185.40860716
Element set: 300
Inclination: 82.5365 deg
RA of node: 311.4907 deg
Eccentricity: 0.0015744
Arg of perigee: 218.0746 deg
Mean anomaly: 141.9258 deg
Mean motion: 13.16967498 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28552
Checksum: 315

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94187.89787671
Element set: 684
Inclination: 99.1727 deg
RA of node: 177.2915 deg
Eccentricity: 0.0012858
Arg of perigee: 77.2410 deg
Mean anomaly: 283.0203 deg
Mean motion: 14.13000384 rev/day
Decay rate: 1.05e-06 rev/day^2
Epoch rev: 29800
Checksum: 310

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94187.30301115
Element set: 301
Inclination: 82.5202 deg
RA of node: 128.6831 deg
Eccentricity: 0.0013694
Arg of perigee: 166.9199 deg
Mean anomaly: 193.2325 deg
Mean motion: 13.84367473 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 27033
Checksum: 304

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94186.48673727

Element set: 84
Inclination: 82.5514 deg
RA of node: 257.3229 deg
Eccentricity: 0.0005770
Arg of perigee: 242.8731 deg
Mean anomaly: 117.1799 deg
Mean motion: 13.04403005 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22528
Checksum: 294

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94184.49601309
Element set: 805
Inclination: 82.5436 deg
RA of node: 195.5122 deg
Eccentricity: 0.0017674
Arg of perigee: 99.6833 deg
Mean anomaly: 260.6332 deg
Mean motion: 13.84189364 rev/day
Decay rate: .00000000 rev/day^2
Epoch rev: 20287
Checksum: 305

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94187.03709703
Element set: 8
Inclination: 98.8377 deg
RA of node: 206.5732 deg
Eccentricity: 0.0015631
Arg of perigee: 322.4799 deg
Mean anomaly: 37.5274 deg
Mean motion: 14.01357741 rev/day
Decay rate: -1.6e-07 rev/day^2
Epoch rev: 19634
Checksum: 316

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94187.90737693
Element set: 814
Inclination: 82.5256 deg
RA of node: 130.2947 deg
Eccentricity: 0.0014115
Arg of perigee: 0.0689 deg
Mean anomaly: 0.0465 deg
Mean motion: 13.83584495 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 19048

Checksum: 303

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94188.00639955
Element set: 713
Inclination: 82.5411 deg
RA of node: 155.5829 deg
Eccentricity: 0.0014471
Arg of perigee: 132.8228 deg
Mean anomaly: 227.4109 deg
Mean motion: 13.16463678 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15396
Checksum: 305

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94187.81959489
Element set: 88
Inclination: 98.6169 deg
RA of node: 215.1640 deg
Eccentricity: 0.0012622
Arg of perigee: 175.1069 deg
Mean anomaly: 185.0235 deg
Mean motion: 14.22424944 rev/day
Decay rate: 1.24e-06 rev/day^2
Epoch rev: 16332
Checksum: 307

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94185.30464082
Element set: 721
Inclination: 82.5524 deg
RA of node: 104.6596 deg
Eccentricity: 0.0013168
Arg of perigee: 148.3043 deg
Mean anomaly: 211.8871 deg
Mean motion: 13.16831473 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13871
Checksum: 292

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94183.48809106
Element set: 313
Inclination: 82.5483 deg
RA of node: 194.3091 deg
Eccentricity: 0.0021673

```
Arg of perigee: 179.1448 deg
Mean anomaly: 180.9751 deg
Mean motion: 13.83009852 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 4220
Checksum: 298

/EX
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988. ORBS$189.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 04:42:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-189.m.1994@ampr.org>
Source record: 27292
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-189.M
Orbital Elements 189.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX July 8, 1994
BID: $ORBS-189.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94184.20806376
Element set: 295
Inclination: 98.6494 deg
RA of node: 259.9220 deg
Eccentricity: 0.0010501
Arg of perigee: 145.5655 deg
Mean anomaly: 214.6206 deg
Mean motion: 14.28031871 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 3998
Checksum: 307

Satellite: MIR
Catalog number: 16609
Epoch time: 94188.23091890
Element set: 668
Inclination: 51.6473 deg
RA of node: 86.1256 deg
Eccentricity: 0.0002579
Arg of perigee: 120.4443 deg
Mean anomaly: 239.6803 deg
Mean motion: 15.56461441 rev/day
Decay rate: 1.554e-05 rev/day^2
Epoch rev: 2808
Checksum: 308

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94186.22999007
Element set: 503
Inclination: 28.4684 deg
RA of node: 120.0714 deg
Eccentricity: 0.0005903
Arg of perigee: 274.7258 deg
```

Mean anomaly: 85.2653 deg
Mean motion: 14.90635014 rev/day
Decay rate: 4.99e-06 rev/day^2
Epoch rev: 3208
Checksum: 294

Satellite: GRO
Catalog number: 21225
Epoch time: 94186.08527972
Element set: 113
Inclination: 28.4603 deg
RA of node: 107.8718 deg
Eccentricity: 0.0003328
Arg of perigee: 60.2866 deg
Mean anomaly: 299.8090 deg
Mean motion: 15.41004865 rev/day
Decay rate: 2.278e-05 rev/day^2
Epoch rev: 5970
Checksum: 303

Satellite: UARS
Catalog number: 21701
Epoch time: 94187.88533404
Element set: 547
Inclination: 56.9858 deg
RA of node: 80.1287 deg
Eccentricity: 0.0005926
Arg of perigee: 103.6172 deg
Mean anomaly: 256.5525 deg
Mean motion: 14.96398066 rev/day
Decay rate: -1.971e-05 rev/day^2
Epoch rev: 15388
Checksum: 334

/EX

989. ORBS$189.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 04:45:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-189.n.1994@ampr.org>
Source record: 27293
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-189.N
2Line Orbital Elements 189.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX July 8, 1994
BID: $ORBS-189.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94176.41110075 -.00000306 00000-0 10000-3 0 2893
2 14129 27.0856 321.0039 6024383 189.2195 150.8337 2.05882336 82954
UO-11
1 14781U 84021B 94186.07267686 .00000122 00000-0 28448-4 0 7056
2 14781 97.7857 199.9598 0010908 209.5355 150.5234 14.69226745552933
RS-10/11
1 18129U 87054A 94187.82828537 .00000033 00000-0 20156-4 0 9249
2 18129 82.9250 314.3214 0011550 338.1080 21.9579 13.72339007352606
AO-13
1 19216U 88051B 94180.17114065 -.00000492 00000-0 10000-4 0 9269
2 19216 57.7928 244.7541 7213733 344.7303 1.9030 2.09725008 46260
FO-20
1 20480U 90013C 94184.97566234 -.00000020 00000-0 35514-4 0 7033
2 20480 99.0371 333.6238 0540509 301.5076 53.4288 12.83226012206283
AO-21
1 21087U 91006A 94187.32341330 .00000094 00000-0 82657-4 0 4868
2 21087 82.9440 128.5539 0037000 31.5792 328.7574 13.74542337172215
RS-12/13
1 21089U 91007A 94186.51538083 .00000026 00000-0 10881-4 0 7053
2 21089 82.9194 357.8515 0030918 58.0299 302.3847 13.74043103171162
ARSENE
1 22654U 93031B 94169.23096299 -.00000111 00000-0 00000 0 0 2631
2 22654 1.8748 99.1484 2919067 184.0582 172.2245 1.42202724 1217
UO-14
1 20437U 90005B 94185.22963909 .00000009 00000-0 20566-4 0 79
2 20437 98.5890 269.7744 0011398 136.9991 223.2086 14.29848391232027
AO-16
1 20439U 90005D 94187.10391636 .00000016 00000-0 23065-4 0 8064
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2 20439 98.5965 272.8750 0011799 132.7023 227.5147 14.29902664232309
DO-17
1 20440U 90005E 94186.77654850 .00000014 00000-0 22218-4 0 8065
2 20440 98.5979 272.8817 0011862 132.7562 227.4620 14.30042144232270
WO-18
1 20441U 90005F 94185.21288967 .00000008 00000-0 20089-4 0 8085
2 20441 98.5985 271.3372 0012255 137.8043 222.4091 14.30016126232059
LO-19
1 20442U 90005G 94187.77859823 .00000017 00000-0 23294-4 0 8052
2 20442 98.5996 274.1338 0012634 129.7145 230.5152 14.30112885232438
UO-22
1 21575U 91050B 94185.75312930 .00000006 00000-0 16504-4 0 5095
2 21575 98.4342 259.8954 0006811 235.8685 124.1854 14.36921919155604
KO-23
1 22077U 92052B 94185.26723086 -.00000037 00000-0 10000-3 0 4043
2 22077 66.0823 244.2195 0014697 282.7245 77.2124 12.86287015 88985
AO-27
1 22825U 93061C 94184.21585282 .00000000 00000-0 17962-4 0 3024
2 22825 98.6529 259.8634 0008610 156.8774 203.2792 14.27628007 39970
IO-26
1 22826U 93061D 94188.19029709 .00000008 00000-0 20926-4 0 3036
2 22826 98.6524 263.8369 0009331 147.0437 213.1333 14.27732719 40547
KO-25
1 22830U 93061H 94188.19631415 -.00000015 00000-0 11300-4 0 3084
2 22830 98.5532 260.8802 0012308 115.3619 244.8834 14.28059134 40559
NOAA-9
1 15427U 84123A 94187.77737331 .00000015 00000-0 31973-4 0 8659
2 15427 99.0518 238.4969 0015025 160.4623 199.7124 14.13625911493113
NOAA-10
1 16969U 86073A 94187.88940346 .00000071 00000-0 48453-4 0 7631
2 16969 98.5087 196.2905 0012101 273.9586 86.0210 14.24895287405418
MET-2/17
1 18820U 88005A 94187.24254063 .00000024 00000-0 79678-5 0 3290
2 18820 82.5409 253.4248 0017610 122.8796 237.4058 13.84718051324991
MET-3/2
1 19336U 88064A 94185.40860716 .00000051 00000-0 10000-3 0 3003
2 19336 82.5365 311.4907 0015744 218.0746 141.9258 13.16967498285523
NOAA-11
1 19531U 88089A 94187.89787671 .00000105 00000-0 81107-4 0 6842
2 19531 99.1727 177.2915 0012858 77.2410 283.0203 14.13000384298004
MET-2/18
1 19851U 89018A 94187.30301115 .00000049 00000-0 30239-4 0 3014
2 19851 82.5202 128.6831 0013694 166.9199 193.2325 13.84367473270334
MET-3/3
1 20305U 89086A 94186.48673727 .00000044 00000-0 10000-3 0 840
2 20305 82.5514 257.3229 0005770 242.8731 117.1799 13.04403005225287
MET-2/19
1 20670U 90057A 94184.49601309 .00000000 00000-0 -13090-4 0 8058
2 20670 82.5436 195.5122 0017674 99.6833 260.6332 13.84189364202871
FY-1/2
```

```
1 20788U 90081A 94187.03709703 -.00000016 00000-0 17930-4 0 84
2 20788 98.8377 206.5732 0015631 322.4799 37.5274 14.01357741196340
MET-2/20
1 20826U 90086A 94187.90737693 .00000062 00000-0 42694-4 0 8147
2 20826 82.5256 130.2947 0014115 0.0689 0.0465 13.83584495190486
MET-3/4
1 21232U 91030A 94188.00639955 .00000051 00000-0 10000-3 0 7134
2 21232 82.5411 155.5829 0014471 132.8228 227.4109 13.16463678153965
NOAA-12
1 21263U 91032A 94187.81959489 .00000124 00000-0 75170-4 0 881
2 21263 98.6169 215.1640 0012622 175.1069 185.0235 14.22424944163321
MET-3/5
1 21655U 91056A 94185.30464082 .00000051 00000-0 10000-3 0 7217
2 21655 82.5524 104.6596 0013168 148.3043 211.8871 13.16831473138715
MET-2/21
1 22782U 93055A 94183.48809106 .00000041 00000-0 23582-4 0 3133
2 22782 82.5483 194.3091 0021673 179.1448 180.9751 13.83009852 42201
POSAT
1 22829U 93061G 94184.20806376 .00000035 00000-0 31867-4 0 2956
2 22829 98.6494 259.9220 0010501 145.5655 214.6206 14.28031871 39987
MIR
1 16609U 86017A 94188.23091890 .00001554 00000-0 28387-4 0 6686
2 16609 51.6473 86.1256 0002579 120.4443 239.6803 15.56461441 28085
HUBBLE
1 20580U 90037B 94186.22999007 .00000499 00000-0 34525-4 0 5036
2 20580 28.4684 120.0714 0005903 274.7258 85.2653 14.90635014 32081
GRO
1 21225U 91027B 94186.08527972 .00002278 00000-0 47491-4 0 1135
2 21225 28.4603 107.8718 0003328 60.2866 299.8090 15.41004865 59705
UARS
1 21701U 91063B 94187.88533404 -.00001971 00000-0 -15148-3 0 5475
2 21701 56.9858 80.1287 0005926 103.6172 256.5525 14.96398066153889
/EX
```

990. * SpaceNews 11-Jul-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 15:25:15 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0711.1994@ampr.org>
Source record: 27294
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0711
* SpaceNews 11-Jul-94 *

BID: $SPC0711

=========
SpaceNews
=========

MONDAY JULY 11, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* UNAMSAT-1 NEWS *
==================
David Liberman, XE1TU, reports that the UNAMSAT-1 spacecraft has not yet been launched. A postponment was announced through official correspondence from the Russian Space Agency just a few days before project officials had to depart for Russia, and no statement regarding the length of the delay was mentioned. It has now become apparent that the civil and military crew involved in the launch of UNAMSAT-1 are on summer vacation, possibly delaying the launch until September.

In the mean time, project officials are experimenting with the satellite on the ground, making small adjustments, and testing the satellite for all possible situations. Through this experimentation, a problem with the fire code not resetting the CPU was discovered. All the operating software has been loaded on the satellite and is running well. The BBS is being used by local amateurs with microsat ground stations.

[Info via David, XE1TU of the UNAMSAT-1 Team]

* AO-13 ATTITUDE CHANGE *
=========================
The AMSAT-OSCAR-13 satellite has undergone a recent attitude change. The following message issued by spacecraft controller G3RUH explains some of the details:

L QST de G3RUH 1994 Jul 05. Magnetorquing from attitude 243/+5 to 180/0 commences on Jul 07 [Thu] 0510 utc, orbit 4642/224, and continues for 10+ perigees. Estimated interim attitudes are: Orbit Alon/Alat: 4643 235/+4: 4645 221/-2: 4647 211/-10: 4649 205/-10: 4651 193/-12: 4653 181/-13, then a final adjustment. For command purposes during this 4-day period mode-S beacon is ON MA 140-150, i.e. mode-B OFF for 26 mins. The new schedule will start orbit 4651 MA 150 Jul 11 [Mon] 0851 utc. 73 James.

Magnetorquing (attitude changing) is not an exact science, and minor deviations from the above plan sometimes occurs.

Please don't rely on gossip and rumour! Continuous up to date information about AO-13 operations is always available on the beacons, 145.812 MHz or 2400.664 MHz in CW, RTTY and 400 bps PSK. These bulletins are also posted to Internet, ANS, Packet, PacSats etc., and many international newsletters. A 400 bps PSK decoder is available from G3RUH and several DSP products; display software P3C.EXE etc. from many AMSAT groups.

The active command stations are listed below, and constructive feedback about operations is always welcome.

Peter DB2OS @ DB0FAU.#NDS.DEU.EU
James G3RUH @ GB7DDX.#22.GBR.EU
Graham VK5AGR @ VK5WI.#ADL.#SA.AUS.OC

The above may also be reached via Internet (callsign@amsat.org) and KO-23. Please remember to state clearly a return address.

[Info via James Miller, G3RUH @ GB7DDX.#22.GBR.EU]

* LUSAT-OSCAR-19 NEWS *
=======================
The LUSAT-OSCAR-19 satellite continues to operate without its file server running. The following beacon was received from LO-19 by KD2BD in New Jersey last week:

LUSAT-1>AMARG <UI>:

May 21.

OBC crashed on May 17 at +/- 2:45 utc, lat 45s, lon 43 w.
Only digipeater is available.

LU8DYF, LO-19 command station.

Although the file server is not available, the satellite does function as a digipeater, and other ground stations can be connected to via LUSAT-1.

* DOVE DECODER AVAILABLE *
==========================
A DOVE-OSCAR-17 satellite telemetry decoding program for the MS-DOS operating system has been created by KD2BD and is now available via anonymous FTP at pilot.njin.net. The program has been compressed into a file called "duvdec10.zip", and is located in the /pub/SpaceNews/software sub-directory at pilot.njin.net.

The program will read and interpret ASCII telemetry transmissions made by DOVE-OSCAR-17 and generate reports based on that data. The software is free and is intended for non-commercial use.

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

GM1SXX N2SMT N2WYU VU3KNA ZR6AIU N8BMA Jay Respler

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

991. Re: Looking for STSORBIT (*not* Plus) - found!

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 17:31:06 UTC
From: ahm@hogpd.ho.att.com
Message-ID: <CsMtzv.6A2@nntpa.cb.att.com>
Source record: 27295

In rec.radio.amateur.space, I wrote:

> Can anyone tell me where I can find STSORBIT via ftp?

I was able to ftp it from spacelink.msfc.nasa.gov
The filename is STS9201.ZIP

Note: the ftp server there isn't setup completely, so you won't be able
to see any files in the directory!

Thanks to Don Ryan, N2QFE for the info.

Andy
--
==--
-=======- Andreas Meyer, N2FYE ahm@hogpa.att.com
--==---- AT&T Bell Laboratories, Holmdel NJ ..!att!hogpa!ahm
----

992. Re: oscar rigs, etc.

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 18:07:20 UTC
From: ao859@FreeNet.Carleton.CA
Message-ID: <CsMvo8.2nB@freenet.carleton.ca>
Source record: 27296

To get started with satellite communications a 25w or 50w 2m all mode
with a 3 el or 4el yagi mounted horizontal is ok for uplink to
2 satellites , RS10 and FO20. for the downlink you require
a 10m rig , i suggest an Radioshack HTX100 , they can be had for $100
this will do for the RS10 downlink using crossed horiz dipoles
and maybe a preamp for HF. Kit from Hamtronics NY $29.00.
then for FO20 downlink build an 8 el Quagi , using pine and 1/8 aluminium
rod for elements and #14 copper house wire for drive and reflector
see ARRL antenna handbook for dimensions (one eveing project) just
follow instructions. then to convert from UHF FO20 downlink to
HF 10m Hamtronics 435.5-437.5 rx converter kit $49.00. and you can
reuse your 10m preamp for this as well.
You will have to do a little work to get to FO20 however RS10 is
easy to begin sat operation.

Jeff, Ve3eff
ex\
--

993. KLV vs. M2 antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 18:50:14 UTC
From: Wayne_Estes@csg.mot.COM
Message-ID: <9407081350.ZM10079@SALCIUS2>
Source record: 27297

Has anyone ever compared M2 antennas to the small KLM satellite antennas?
They both use 14 elements on VHF.
KLM is 22 elements on UHF, and M2 is 30 elements on UHF.

I would be particularly interested in any comments about the following:
1. gain
2. overall mechanical construction
3. performance in rain, snow, and ice
4. ease of polarity switching

Also, is a wood closet rod acceptable as a crossboom?
If so, is polyurethane an acceptable sealant?

Please respond to the newsgroup (others are interested in M2 vs. KLM comments)
or directly to wayne@csg.mot.com

Thanks, and 73,
Wayne Estes WD5FFH, Mundelein, IL

994. Multiple questions on satellite stuff

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 19:18:00 UTC
From: barkman@zeta.is.tcu.edu
Message-ID: <1994Jul8.142230.239@news.tcu.edu>
Source record: 27299

Any one have two-line elements for the moon. Mine seem to be old (not a joke). Actually, the keps I have put the moon in a slightly different position than a GPS receiver said it would be.

What is the latest version of InstanTrak? Also, how does it determine the age of a satellite from the International ID? In effect, how is the ID composed?

thanks

995. Re: Looking for STSORBIT (*not* Plus) - found!

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 19:50:30 UTC
From: ahm@hogpd.ho.att.com
Message-ID: <Csn0G7.Azn@nntpa.cb.att.com>
Source record: 27298

```
> I was able to ftp it from spacelink.msfc.nasa.gov
> The filename is STS9201.ZIP
>
> Note: the ftp server there isn't setup completely, so you won't be able
> to see any files in the directory!

Be sure to login as "anonymous", the password is "guest".

Andy
--
==--
-=======--- Andreas Meyer, N2FYE ahm@hogpa.att.com
--==----- AT&T Bell Laboratories, Holmdel NJ ..!att!hogpa!ahm
----
```

996. VP5 on RS-12

Newsgroup: rec.radio.amateur.space
Date: 1994-07-08 20:50:28 UTC
From: Tom Skelton <Tom.Skelton@ClemsonSC.NCR.COM>
Message-ID: <Csn384.14y@ncrcae.ColumbiaSC.NCR.COM>
Source record: 27310

Will, AA4NC, is in Turks & Caicos this weekend for the IARU contest. Outside of the contest, he has promised WARC and RS12 activity.
73, Tom WB4iUX

73, Tom WB4iUX
(for mailer impaired: Tom.Skelton@ClemsonSC.NCR.COM)
DX IS !!!!!

997. Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 02:00:54 UTC
From: n4zr@netcom.com
Message-ID: <n4zrCsnHLJ.Aus@netcom.com>
Source record: 27300

Apollo 11 25th Anniversary Amateur Radio Special Event Station Activity

At 1627 EDT, Sunday afternoon, July 20, 1969, astronaut Neil A. Armstrong spoke the words "Houston, Tranquility Base here. The Eagle has landed." At 2256 EDT, later the same day, Armstrong stepped down from the ladder of the Lunar Module onto the Moon's surface and spoke the words, "That's one small step for a man, one giant leap for mankind."

To commemorate that historic event twenty-five years ago next week, amateur radio clubs and groups at NASA Headquarters and the various NASA field centers will be on the air as "Special Event Stations", contacting amateur radio operators around the world.

Amateur Radio clubs or groups from twelve NASA locations are currently preparing for the 60-hour special event operating period from their respective facilities. Ham groups from other NASA locations may also be on-line to participate by the time the special event period arrives. This is the first time so many NASA stations will be represented on the air at one time. Contacts with these stations during the special event period will be confirmed on request with a certificate to commemorate man's first steps on the Moon and the special event activity.

Details:

Event Name:
Apollo 11 Moon Landing 25th Anniversary

Date/Time Period:
1700Z, July 19 through 0500Z, July 22
(1300 EDT, July 19 through 0100, July 22)

Modes:
CW, SSB, FM, Packet, Pactor, Amtor, RTTY, SSTV, ATV, Satellites.

Frequencies:
HF CW/SSB: Check 11 (as in Apollo 11) kHz up from the bottom of the General Class portion of the amateur radio bands (except 10m SSB: 28.411+ MHz).

Other Modes:
Check modes/frequencies as indicated by the individual stations below.

QSL Information:
A certificate is being designed to commemorate this special event activity, which will be individualized for each special event station.

Domestic Stations: Send a 9" x 12" self-addressed, stamped envelope to the callbook address (CBA) of the station worked or to the address

specified by the station worked. Attach $0.52 postage to cover
return mailing.

DX Stations: Send a 9" x 12" self-addressed envelope to the
appropriate address, with sufficient IRC's or U.S. Postage for return
mailing of up to 1.5 oz (42.52 grams).
Europe = $1.40US postage (3 IRC);
Mexico = $0.63US postage (2 IRC);
Canada = $0.55US (2 IRC).

Individual Station Specifics:
==========

Ames Amateur Radio Club,
NASA Ames Research Center, Moffett Field, CA
Callsign: K6MF
Bands: 40-10m (excl. WARC), 2m
Modes: CW, SSB, FM
Special Freqs: 145.585 MHz
QSL Address: AARC
Box 73
Moffett Field, CA 94035-1000

Dryden Amateur Radio Club,
NASA Dryden Flight Research Center, Edwards, CA
Callsign: KF7GD
Bands: 80-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m SSB: 144.25 MHz; FM: 146.55 MHz
QSL Address: NASA DFRC
Attn: Dryden ARC
POB 273
Edwards, CA 93523

Goddard Amateur Radio Club, Inc.,
NASA Goddard Space Flight Center, Greenbelt, MD
Callsign: WA3NAN
Bands: 160-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m: 146.58 FM Simplex
QSL Address: Callbook Address, or
GARC
P.O. Box 86
Greenbelt, MD 20768-0086

Guam Contingency Landing Site Amateur Radio Group
Guam
Callsign: KC4YDP/KH2
Bands: 80-10m (incl WARC)
Modes: CW, SSB
Special Freqs:
QSL Address: NASA

RADIO
Kennedy Space Center, Florida 32899

NASA Headquarters Amateur Radio Group
Washington, D.C.
Callsign: N4ZR
Bands: 80-10 (incl WARC)
Modes: CW, SSB
Special Freqs:
QSL Address: CBA
N4ZR
2003 Sarazen Place
Reston, VA 22091-3809

Jet Propulsion Laboratory Amateur Radio Club and
Goldstone Amateur Radio Club
Jet Propulsion Laboratory, Pasadena, CA
Callsign: W6VIO
Bands: 80-10 (incl WARC), 2m
Modes: CW, SSB, Amtor, Packet, RTTY, Pactor
Special Freqs: SSTV: 14.230 MHz
Packet Node/BBS (W6VIO-1):
144.090/223.540 MHz
2m Repeaters (freq in MHz):
(W6VIO) 147.15+/224.72-
(WB6TZS)145.28-/223.96-/447.325-
Satellites: AO10/13/LEOS SSB/CW
QSL Address: Jet Propulsion Laboratory Amateur Radio Club
M/S 168-327
4800 Oak Grove Dr.
Pasadena, Ca. 91109

Johnson Space Center Amateur Radio Club
NASA Johnson Space Center, Houston, TX
Callsign: W5RRR
Bands: 80-10 (incl WARC), 2m, 70cm
Modes: CW, SSB, FM, Digital Modes,
SSTV, ATV, Satellites
Special Freqs: 2m repeaters
QSL Address: JSC ARC/W5RRR
Johnson Space Center
Houston, Texas 77058
BBS: (713)244-5625

Kennedy Space Center Amateur Radio Group
Kennedy Space Center, FL
Callsign: KC4TCV (SSB) / AD4NA (CW)
Bands: 160-10m (incl WARC)
Modes: CW, SSB, Pactor, RTTY, Satellites
Special Freqs: Packet: 145.09 MHz;
2m Repeater 146.34/.94, 146.31/.91, 146.96/.36

QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Lewis Amateur Radio Club (NLARC)
NASA Lewis Research Center, Cleveland, OH
Callsign: AK8Y
Bands: 80-10m
Modes: CW, SSB, RTTY, Amtor, Pactor, FM, Satellites
Special Freqs: Repeaters: 147.195+/444.1 MHz
RTTY: 14.080-90MHz
Amtor/Pactor: 14.060-80MHz.
Packet: 145.01MHz (call: AK8Y-8)
QSL Address: NASA Lewis Amateur Radio Club
21000 Brookpark Rd, MS 54-6
Cleveland, OH 44135
Attn: Don Hilderman

Marshall Amateur Radio Club
NASA Marshall Space Flight Center, Huntsville, AL
Callsign: WA4NZD
Bands: 160-6m (incl WARC)
Modes: Primarily SSB
Special Freqs: 6m: 50.130 MHz; Oscar 13, Mode B
QSL Address: Marshall Amateur Radio Club
CM21X
MSFC, AL 35812
Phone Message: (205)544-7568

Stennis Space Center Amateur Radio Club
NASA Stennis Space Center, MS
Callsign: K5GY
Bands: 40-10m (no WARC), 2m
Modes: CW, SSB, Novice Bands, Packet
Special Freqs: 2m repeater: 146.70 MHz
QSL Address: Stennis Space Center Amateur Radio Club
Bldg 1201
Stennis Space Center, MS 39529

Wallops Island Amateur Radio Club
NASA Wallops Flight Facility, Wallops Island, VA
Callsign: KE3ND
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs: 2m: 147.55MHz simplex
QSL Address: Wallops Island ARC
NASA Wallops Flight Facility
Building E-134
Wallops Island, VA 23337

White Sands Complex Amateur Radio Group
NASA White Sands Test Facility, Las Cruces, NM

Callsign: KF7E
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs:
QSL Address: KF7E
P.O. Box 627
Organ, NM 88052

--
73, Pete
N4ZR@netcom.com

998. Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 02:04:57 UTC
From: n4zr@netcom.com
Message-ID: <n4zrCsnHsA.B3v@netcom.com>
Source record: 27338
Cross-posted to: rec.radio.amateur.space,rec.radio.info,sci.space.news

Apollo 11 25th Anniversary Amateur Radio Special Event Station Activity

At 1627 EDT, Sunday afternoon, July 20, 1969, astronaut Neil A. Armstrong spoke the words "Houston, Tranquility Base here. The Eagle has landed." At 2256 EDT, later the same day, Armstrong stepped down from the ladder of the Lunar Module onto the Moon's surface and spoke the words, "That's one small step for a man, one giant leap for mankind."

To commemorate that historic event twenty-five years ago next week, amateur radio clubs and groups at NASA Headquarters and the various NASA field centers will be on the air as "Special Event Stations", contacting amateur radio operators around the world.

Amateur Radio clubs or groups from twelve NASA locations are currently preparing for the 60-hour special event operating period from their respective facilities. Ham groups from other NASA locations may also be on-line to participate by the time the special event period arrives. This is the first time so many NASA stations will be represented on the air at one time. Contacts with these stations during the special event period will be confirmed on request with a certificate to commemorate man's first steps on the Moon and the special event activity.

Details:

Event Name:
Apollo 11 Moon Landing 25th Anniversary

Date/Time Period:
1700Z, July 19 through 0500Z, July 22
(1300 EDT, July 19 through 0100, July 22)

Modes:
CW, SSB, FM, Packet, Pactor, Amtor, RTTY, SSTV, ATV, Satellites.

Frequencies:
HF CW/SSB: Check 11 (as in Apollo 11) kHz up from the bottom of the General Class portion of the amateur radio bands (except 10m SSB: 28.411+ MHz).

Other Modes:
Check modes/frequencies as indicated by the individual stations below.

QSL Information:
A certificate is being designed to commemorate this special event activity, which will be individualized for each special event station.

Domestic Stations: Send a 9" x 12" self-addressed, stamped envelope to
the callbook address (CBA) of the station worked or to the address
specified by the station worked. Attach $0.52 postage to cover
return mailing.

DX Stations: Send a 9" x 12" self-addressed envelope to the
appropriate address, with sufficient IRC's or U.S. Postage for return
mailing of up to 1.5 oz (42.52 grams).
Europe = $1.40US postage (3 IRC);
Mexico = $0.63US postage (2 IRC);
Canada = $0.55US (2 IRC).

Individual Station Specifics:
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Ames Amateur Radio Club,
NASA Ames Research Center, Moffett Field, CA
Callsign: K6MF
Bands: 40-10m (excl. WARC), 2m
Modes: CW, SSB, FM
Special Freqs: 145.585 MHz
QSL Address: AARC
Box 73
Moffett Field, CA 94035-1000

Dryden Amateur Radio Club,
NASA Dryden Flight Research Center, Edwards, CA
Callsign: KF7GD
Bands: 80-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m SSB: 144.25 MHz; FM: 146.55 MHz
QSL Address: NASA DFRC
Attn: Dryden ARC
POB 273
Edwards, CA 93523

Goddard Amateur Radio Club, Inc.,
NASA Goddard Space Flight Center, Greenbelt, MD
Callsign: WA3NAN
Bands: 160-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m: 146.58 FM Simplex
QSL Address: Callbook Address, or
GARC
P.O. Box 86
Greenbelt, MD 20768-0086

Guam Contingency Landing Site Amateur Radio Group
Guam
Callsign: KC4YDP/KH2
Bands: 80-10m (incl WARC)
Modes: CW, SSB
Special Freqs:

QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Headquarters Amateur Radio Group
Washington, D.C.
Callsign: N4ZR
Bands: 80-10 (incl WARC)
Modes: CW, SSB
Special Freqs:
QSL Address: CBA
N4ZR
2003 Sarazen Place
Reston, VA 22091-3809

Jet Propulsion Laboratory Amateur Radio Club and
Goldstone Amateur Radio Club
Jet Propulsion Laboratory, Pasadena, CA
Callsign: W6VIO
Bands: 80-10 (incl WARC), 2m
Modes: CW, SSB, Amtor, Packet, RTTY, Pactor
Special Freqs: SSTV: 14.230 MHz
Packet Node/BBS (W6VIO-1):
144.090/223.540 MHz
2m Repeaters (freq in MHz):
(W6VIO) 147.15+/224.72-
(WB6TZS)145.28-/223.96-/447.325-
Satellites: AO10/13/LEOS SSB/CW
QSL Address: Jet Propulsion Laboratory Amateur Radio Club
M/S 168-327
4800 Oak Grove Dr.
Pasadena, Ca. 91109

Johnson Space Center Amateur Radio Club
NASA Johnson Space Center, Houston, TX
Callsign: W5RRR
Bands: 80-10 (incl WARC), 2m, 70cm
Modes: CW, SSB, FM, Digital Modes,
SSTV, ATV, Satellites
Special Freqs: 2m repeaters
QSL Address: JSC ARC/W5RRR
Johnson Space Center
Houston, Texas 77058
BBS: (713)244-5625

Kennedy Space Center Amateur Radio Group
Kennedy Space Center, FL
Callsign: KC4TCV (SSB) / AD4NA (CW)
Bands: 160-10m (incl WARC)
Modes: CW, SSB, Pactor, RTTY, Satellites
Special Freqs: Packet: 145.09 MHz;

2m Repeater 146.34/.94, 146.31/.91, 146.96/.36
QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Lewis Amateur Radio Club (NLARC)
NASA Lewis Research Center, Cleveland, OH
Callsign: AK8Y
Bands: 80-10m
Modes: CW, SSB, RTTY, Amtor, Pactor, FM, Satellites
Special Freqs: Repeaters: 147.195+/444.1 MHz
RTTY: 14.080-90MHz
Amtor/Pactor: 14.060-80MHz.
Packet: 145.01MHz (call: AK8Y-8)
QSL Address: NASA Lewis Amateur Radio Club
21000 Brookpark Rd, MS 54-6
Cleveland, OH 44135
Attn: Don Hilderman

Marshall Amateur Radio Club
NASA Marshall Space Flight Center, Huntsville, AL
Callsign: WA4NZD
Bands: 160-6m (incl WARC)
Modes: Primarily SSB
Special Freqs: 6m: 50.130 MHz; Oscar 13, Mode B
QSL Address: Marshall Amateur Radio Club
CM21X
MSFC, AL 35812
Phone Message: (205)544-7568

Stennis Space Center Amateur Radio Club
NASA Stennis Space Center, MS
Callsign: K5GY
Bands: 40-10m (no WARC), 2m
Modes: CW, SSB, Novice Bands, Packet
Special Freqs: 2m repeater: 146.70 MHz
QSL Address: Stennis Space Center Amateur Radio Club
Bldg 1201
Stennis Space Center, MS 39529

Wallops Island Amateur Radio Club
NASA Wallops Flight Facility, Wallops Island, VA
Callsign: KE3ND
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs: 2m: 147.55MHz simplex
QSL Address: Wallops Island ARC
NASA Wallops Flight Facility
Building E-134
Wallops Island, VA 23337

White Sands Complex Amateur Radio Group
NASA White Sands Test Facility, Las Cruces, NM
Callsign: KF7E
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs:
QSL Address: KF7E
P.O. Box 627
Organ, NM 88052

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73, Pete
N4ZR@netcom.com

999. SAREX Mission Update 7/8 at 23:00 EDT

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 03:24:15 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.001.1994@ampr.org>
Source record: 27301
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.001
SAREX Mission Status 7/8 at 23:00 EDT

Silver Spring, MD, July 8 1994 at 23:00 EDT

The Space Shuttle Columbia roared into the blue skies of the Kennedy Space Center today as the second International Microgravity Laboratory Mission (IML-02) began. The near flawless launch countdown sequence resulted in an on-time launch of the STS-65 mission at 16:43 UTC. The seven member crew of STS-65 will spend 14 days on-orbit. Two of the crew members are ham radio operators. They are Shuttle Commander Robert Cabana, KC5HBV (just licensed) and Don Thomas, KC5FVF. The two will operate the Shuttle Amateur Radio Experiment (SAREX). SAREX is a secondary mid-deck payload that allows ham radio operators and school students the opportunity to talk to the astronauts while they are in orbit. Ground based amateur radio operators can communicate with the two astronaut hams through packet radio and, when time permits, via voice contacts. Thirteen scheduled school group contacts with students in the US, Germany, and Japan are also planned.

The SAREX Working Group expects the SAREX payload to be configured and operational approximately 23 hours into the flight or at approximately 16:30 UTC on July 9. Since the launch was on time, the pre-launch Keplerian element set, JSC-004 is still valid. This element set, developed by Gil Carman, WA5NOM, is provided below for your convenience.

STS-65
1 00065U 94189.74687707 .00052344 00000-0 15762-3 0 47
2 00065 28.4664 7.3074 0003571 330.7493 29.2906 15.90324781 29

Satellite: STS-65
Catalog number: 00065
Epoch time: 94189.74687707 = (08 JUL 94 17:55:30.18 UTC)
Element set: 004
Inclination: 28.4664 deg
RA of node: 7.3074 deg Space Shuttle Flight STS-65
Eccentricity: .0003571 Prelaunch Element set JSC-004
Arg of perigee: 330.7493 deg Launch: 08 JUL 94 16:43 UTC
Mean anomaly: 29.2906 deg
Mean motion: 15.90324781 rev/day Gil Carman, WA5NOM
Decay rate: 5.2344e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 2
Checksum: 295

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX

1000. Shoemaker-Levy

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 04:52:44 UTC
From: Timothy Wietlispach <wietlispach@delphi.com>
Message-ID: <56zS5lk.wietlispach@delphi.com>
Source record: 27302

Looking for individuals attempting to hear the impact of comet Shoemaker-Levy strikes Jupiter?
Thanks

1001. Two-Line Orbital Element Sets (TLE426)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 08:47:43 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.773743663@afit.af.mil>
Source record: 27303

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

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- Current Two-Line Element Sets #426 -
Alouette 1
1 00424U 62049 94185.24401976 .00000070 00000-0 72294-4 0 76
2 00424 80.4636 268.1704 0024442 71.4004 288.9786 13.67814343584734
ATS 1
1 02608U 66110A 94183.75580573 -.00000305 00000-0 10000-3 0 8830
2 02608 14.5645 0.2628 0010262 46.1109 80.7574 1.00372843 17628
ATS 3
1 03029U 67111A 94185.55953940 -.00000115 00000-0 10000-3 0 2150
2 03029 14.6605 7.2869 0009395 267.3767 103.8540 1.00273156 97613
Cosmos 398
1 04966U 71016A 94189.13925013 .00097942 75980-5 18934-3 0 3453
2 04966 51.4359 247.4041 1007472 66.3462 304.0258 13.92830604775663
Starlette
1 07646U 75010A 94185.57612354 -.00000152 00000-0 -51673-5 0 7946
2 07646 49.8254 84.7319 0205768 33.6546 327.7224 13.82186379980253
LAGEOS
1 08820U 76039A 94185.48708651 -.00000005 00000-0 10000-3 0 80
2 08820 109.8199 141.5236 0044343 281.5178 78.0381 6.38664351168250
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94188.28076584 .00000077 00000-0 00000+0 0 3665
2 10061 11.2364 45.4685 0001731 359.9019 204.2941 1.00274417 7316
IUE
1 10637U 78012A 94177.58717309 -.00000279 00000-0 10000-3 0 133
2 10637 34.5952 94.6747 1315754 36.2551 305.7468 1.00265078 12816
GPS BI-01
1 10684U 78020A 94184.89658981 -.00000039 00000-0 10000-3 0 2794
2 10684 64.6556 45.0186 0062328 163.4694 196.8449 1.98069710105267
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GPS BI-02
1 10893U 78047A 94179.16469670 -.00000057 00000-0 10000-3 0 781
2 10893 63.5316 284.0907 0214548 14.0870 346.5490 2.01627765118299
GOES 3
1 10953U 78062A 94186.53831147 .00000064 00000-0 10000-3 0 3270
2 10953 10.1657 48.2605 0005874 66.1982 187.7007 1.00248461 11908
SeaSat 1
1 10967U 78064A 94186.55446546 -.00000021 00000-0 37774-4 0 3030
2 10967 107.9999 140.2231 0002617 254.4221 105.6631 14.37964511839001
GPS BI-03
1 11054U 78093A 94186.33457303 -.00000043 00000-0 10000-3 0 1943
2 11054 63.2158 281.2129 0044252 176.3183 183.7545 1.93505254114866
Nimbus 7
1 11080U 78098A 94186.17152216 -.00000080 00000-0 -34450-4 0 4079
2 11080 99.0493 69.1292 0009750 83.2462 276.9795 13.83730423792569
GPS BI-04
1 11141U 78112A 94186.50590554 -.00000024 00000-0 00000+0 0 8937
2 11141 64.6627 46.2322 0048746 25.9116 334.4025 1.92894869 4138
GPS BI-05
1 11690U 80011A 94184.86474322 -.00000039 00000-0 10000-3 0 8030
2 11690 65.0413 46.7960 0142139 197.4976 162.0817 2.00557165119875
GPS BI-06
1 11783U 80032A 94189.13080090 -.00000008 00000-0 10000-3 0 9831
2 11783 62.6417 277.5207 0210655 29.2542 331.9657 2.03456646104387
GOES 5
1 12472U 81049A 94171.60438444 .00000041 00000-0 10000-3 0 7732
2 12472 6.8313 57.9686 0006782 14.3514 283.7533 1.00320932 5793
Cosmos 1383
1 13301U 82066A 94188.80201329 .00000028 00000-0 15523-4 0 3067
2 13301 82.9312 294.6375 0028937 39.7303 320.5959 13.68056740600240
LandSat 4
1 13367U 82072A 94187.15187883 .00000034 00000-0 17599-4 0 5054
2 13367 98.1794 245.3518 0006409 188.4854 171.6234 14.57132863636824
IRAS
1 13777U 83004A 94188.08041234 -.00000215 00000-0 -11829-3 0 6410
2 13777 98.9681 18.6188 0012318 258.2815 101.6967 13.99201022253926
Cosmos 1447
1 13916U 83021A 94188.94416946 .00000022 00000-0 79180-5 0 4075
2 13916 82.9420 356.3412 0037890 333.9680 25.9572 13.74312088566183
TDRS 1
1 13969U 83026B 94187.73996104 -.00000195 00000-0 10000-4 0 3147
2 13969 7.7400 50.8978 0006155 63.0628 162.1518 1.00275946 14246
GOES 6
1 14050U 83041A 94188.25118362 -.00000006 00000-0 10000-3 0 2303
2 14050 5.6602 60.8682 0005078 337.2970 219.4298 1.00222589 12986
OSCAR 10
1 14129U 83058B 94176.41110075 -.00000306 00000-0 10000-3 0 2893
2 14129 27.0856 321.0039 6024383 189.2195 150.8337 2.05882336 54986
LandSat 5
1 14780U 84021A 94186.77753028 .00000018 00000-0 13875-4 0 934
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2 14780 98.1632 246.1720 0004099 192.6450 167.4646 14.57138757550183
UoSat 2
1 14781U 84021B 94186.07267686 .00000122 00000-0 28448-4 0 7056
2 14781 97.7857 199.9598 0010908 209.5355 150.5234 14.69226745552933
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94189.12305025 .00000019 00000-0 41954-5 0 6068
2 15055 82.9559 49.6137 0027708 155.0690 205.1811 13.73607731503505
GPS BI-10
1 15271U 84097A 94184.59777616 -.00000053 00000-0 10000-3 0 8181
2 15271 62.3441 277.7445 0146601 349.1181 10.6113 2.00583149 70932
Cosmos 1602
1 15331U 84105A 94186.17039494 .00000266 00000-0 28595-4 0 2974
2 15331 82.5341 60.8923 0020727 139.0326 221.2452 14.84425648527185
NOAA 9
1 15427U 84123A 94189.05140136 .00000058 00000-0 54683-4 0 8675
2 15427 99.0519 239.7864 0015159 157.3698 202.8144 14.13626543493296
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94188.87297113 .00002144 00000-0 36545-4 0 6694
2 16609 51.6476 82.9139 0002397 119.8750 240.2481 15.56467908 28188
SPOT 1
1 16613U 86019A 94186.81244699 .00000089 00000-0 62356-4 0 6947
2 16613 98.6889 260.1173 0000919 28.3901 331.7323 14.20054761119204
Cosmos 1766
1 16881U 86055A 94187.85511547 .00000317 00000-0 35605-4 0 2136
2 16881 82.5194 117.3105 0019239 156.7967 203.4117 14.83455157428373
EGP
1 16908U 86061A 94186.55002583 -.00000097 00000-0 00000+0 0 9021
2 16908 50.0113 27.9423 0011210 359.8624 0.2206 12.44409976 27673
NOAA 10
1 16969U 86073A 94189.01293174 .00000093 00000-0 58115-4 0 7649
2 16969 98.5086 197.3796 0012119 270.3457 89.6334 14.24895814405573
MOS-1
1 17527U 87018A 94188.78537436 .00000091 00000-0 99794-4 0 914
2 17527 99.0304 257.0434 0000881 26.0299 334.0903 13.94909682375816
GOES 7
1 17561U 87022A 94188.94302778 -.00000041 00000-0 10000-3 0 9124
2 17561 1.5948 75.4644 0004688 352.5895 84.5714 1.00268572 10182
Kvant-1
1 17845U 87030A 94188.80877729 -.00004000 00000-0 -48615-4 0 9030
2 17845 51.6470 83.2436 0002596 113.5397 246.6501 15.56468298479320
DMSP B5D2-3
1 18123U 87053A 94189.00690489 .00000012 00000-0 28295-4 0 5501
2 18123 98.7865 20.4013 0014712 117.7885 242.4782 14.15363377363957
RS-10/11
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1 18129U 87054A 94187.82828537 .00000033 00000-0 20156-4 0 9249
2 18129 82.9250 314.3214 0011550 338.1080 21.9579 13.72339007352606
Meteor 2-16
1 18312U 87068A 94187.46043330 .00000018 00000-0 25460-5 0 3036
2 18312 82.5538 196.5688 0014150 60.3566 299.9005 13.84033103347721
Meteor 2-17
1 18820U 88005A 94188.68769394 .00000022 00000-0 57511-5 0 3309
2 18820 82.5412 252.2757 0017710 118.9450 241.3489 13.84718056325191
DMSP B5D2-4
1 18822U 88006A 94189.01685886 .00000026 00000-0 30251-4 0 6581
2 18822 98.4390 43.1190 0005676 293.0828 66.9752 14.22957963333484
Glonass 34
1 19163U 88043A 94188.12884591 -.00000013 00000-0 10000-3 0 9024
2 19163 65.0417 109.7786 0007383 162.6606 197.3687 2.13102312 47086
Glonass 36
1 19165U 88043C 94183.96133015 -.00000026 00000-0 10000-3 0 2950
2 19165 65.0166 109.8799 0003786 322.7620 37.1995 2.13102235 47618
METEOSAT 3
1 19215U 88051A 94189.20174994 -.00000250 00000-0 10000-3 0 9405
2 19215 1.7776 72.0548 0001112 48.4793 163.3224 1.00261416 10120
AO-13
1 19216U 88051B 94180.17114065 -.00000492 00000-0 10000-4 0 9269
2 19216 57.7928 244.7541 7213733 344.7303 1.9030 2.09725008 14760
OKEAN 1
1 19274U 88056A 94187.57947608 .00000164 00000-0 17551-4 0 9135
2 19274 82.5126 217.5154 0018912 311.4335 48.5253 14.82191496323959
Meteor 3-2
1 19336U 88064A 94185.40860716 .00000051 00000-0 10000-3 0 3003
2 19336 82.5365 311.4907 0015744 218.0746 141.9258 13.16967498285523
Glonass 39
1 19503U 88085C 94185.39524320 -.00000049 00000-0 10000-3 0 1969
2 19503 65.7464 348.7579 0005086 156.9924 203.0338 2.13102094 45134
NOAA 11
1 19531U 88089A 94188.96003381 .00000078 00000-0 66668-4 0 6855
2 19531 99.1729 178.3802 0012875 74.5201 285.7393 14.13000365298154
TDRS 2
1 19548U 88091B 94187.88221553 .00000125 00000-0 10000-3 0 9583
2 19548 1.0584 77.3260 0003205 108.7991 272.6698 0.99828185 8409
Glonass 40
1 19749U 89001A 94185.90376337 -.00000028 00000-0 10000-3 0 4049
2 19749 64.9896 109.4333 0006265 262.4263 97.4905 2.13101456 42655
Glonass 41
1 19750U 89001B 94186.89863109 -.00000023 00000-0 10000-3 0 3020
2 19750 64.9880 109.4423 0006277 270.1611 89.7276 2.13102189 42699
GPS BII-01
1 19802U 89013A 94187.17204108 .00000007 00000-0 10000-3 0 9196
2 19802 55.1108 138.9569 0030799 179.9682 180.0019 2.00553117 39435
Akebono
1 19822U 89016A 94188.87066849 .00004026 00000-0 22412-3 0 2881
2 19822 75.0988 170.8617 3817061 275.6858 43.0950 7.78440424110900
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Meteor 2-18
1 19851U 89018A 94187.30301115 .00000049 00000-0 30239-4 0 3014
2 19851 82.5202 128.6831 0013694 166.9199 193.2325 13.84367473270334
MOP-1
1 19876U 89020B 94182.61686523 -.00000071 00000-0 00000+0 0 372
2 19876 0.4834 64.6979 0001739 64.6567 3.9451 1.00272202 308
TDRS 3
1 19883U 89021B 94187.69433138 -.00000260 00000-0 00000+0 0 9476
2 19883 0.0442 220.1793 0004348 100.6200 172.6669 1.00275026192061
GPS BII-02
1 20061U 89044A 94187.51507632 -.00000082 00000-0 10000-3 0 9368
2 20061 54.6432 315.6565 0129688 208.7848 150.4977 2.00565211 37181
Nadezhda 1
1 20103U 89050A 94188.98354991 .00000048 00000-0 35064-4 0 373
2 20103 82.9617 272.4176 0036575 230.4330 129.3593 13.73841146251166
GPS BII-03
1 20185U 89064A 94183.86035496 .00000025 00000-0 00000+0 0 9311
2 20185 54.9383 139.6902 0010604 271.6793 88.1714 2.00569961 35685
GMS 4
1 20217U 89070A 94188.30036709 -.00000280 00000-0 10000-3 0 349
2 20217 0.2956 71.6776 0001010 57.8358 43.6997 1.00264271 18299
GPS BII-04
1 20302U 89085A 94186.38800052 .00000004 00000-0 00000+0 0 9398
2 20302 53.5669 255.9822 0003889 237.5729 122.4919 2.00565374 34534
Meteor 3-3
1 20305U 89086A 94186.48673727 .00000044 00000-0 10000-3 0 840
2 20305 82.5514 257.3229 0005770 242.8731 117.1799 13.04403005225287
COBE
1 20322U 89089A 94185.45711993 .00000291 00000-0 21407-3 0 236
2 20322 98.9763 201.3744 0008255 221.1404 138.9132 14.03442778236815
Kvant-2
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2 23114 51.6455 112.7851 0003181 103.5149 256.6932 15.56424152 6352
FOTON 9
1 23122U 94033A 94183.02474300 .00004755 80277-5 10000-4 0 226
2 23122 62.8298 26.2472 0102089 108.6557 252.4353 15.96124431 2778
1994033B
1 23123U 94033B 94189.19518584 .01709733 85847-5 52705-3 0 644
2 23123 62.7871 0.7250 0025042 109.7058 250.6577 16.25306123 3780
Intelsat7F2
1 23124U 94034A 94187.84366369 -.00000249 00000-0 10000-3 0 267
2 23124 0.0537 175.2042 0018400 291.9042 83.4768 1.00280430 138
STRV-1A
1 23125U 94034B 94183.87103682 -.00004942 00000-0 -21667-2 0 135
2 23125 7.0324 179.2968 7278646 190.6436 134.4693 2.27278314 367
STRV-1B
```

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1 23126U 94034C 94186.97243133 .00000643 00000-0 25266-3 0 150
2 23126 7.0199 178.0727 7279576 193.0602 125.1619 2.26896056 434
1994034D
1 23127U 94034D 94187.97432223 -.00000029 00000-0 10000-4 0 129
2 23127 7.0444 178.3481 7259488 192.9650 125.8655 2.20412726 449
1994035B
1 23133U 94035B 94188.45048932 .00047578 00000-0 16882-2 0 201
2 23133 26.9643 290.0812 5379834 194.4812 140.4662 5.09093655 683
1994032D
1 23134U 94032D 94187.49335516 .00560995 97987-4 24885-2 0 219
2 23134 82.5807 0.5309 0128056 325.8774 33.3115 15.72845340 4650
1994032E
1 23135U 94032E 94188.61176650 .00603619 10811-3 29646-2 0 207
2 23135 82.5745 359.4657 0151483 314.8489 44.0403 15.67132616 4822
1994032F
1 23136U 94032F 94186.99350058 .41356391 -10540-5 27184-2 0 230
2 23136 82.5570 0.6241 0017501 20.6338 349.0789 16.39644744 4601
1994032G
1 23137U 94032G 94187.93947374 .01295840 -12012-5 87232-3 0 187
2 23137 82.5731 359.5892 0030355 16.9425 343.8418 16.15683561 4757
1994032H
1 23138U 94032H 94188.91298313 .00170307 10691-4 24868-3 0 240
2 23138 82.5793 358.6159 0058172 22.5344 337.8465 16.01662963 4902
1994036A
1 23139U 94036A 94188.80878543 -.00000526 00000-0 -44080-6 0 171
2 23139 51.6464 83.2436 0002629 111.3552 248.8804 15.56471151 1000
1994036B
1 23140U 94036B 94184.64870170 .18771372 12891-4 16650-3 0 129
2 23140 51.6273 103.4565 0018529 47.9247 312.9460 16.50188044 358
1994033C
1 23141U 94033C 94188.89896362 .00665384 00000-0 43790-2 0 135
2 23141 62.8131 4.3345 0089277 23.4640 337.0895 15.68403515 3696
1994033D
1 23142U 94033D 94188.89835330 .00314486 00000-0 22117-2 0 150
2 23142 62.8139 4.3083 0094888 21.8368 338.6724 15.67026929 3694
1994033E
1 23143U 94033E 94188.59654720 .00004661 80743-5 10000-4 0 80
2 23143 62.8069 4.4808 0088548 112.4224 248.6330 15.98071752 3665
1994033F
1 23144U 94033F 94188.63892474 .00890261 82303-5 77013-3 0 164
2 23144 62.8111 4.1155 0068480 118.2440 243.0629 16.07682942 3674
1994037A
1 23145U 94037A 94188.23339784 .00273033 81644-5 10841-3 0 126
2 23145 62.9551 333.3228 0120974 143.3023 217.6522 16.07922573 634
1994037B
1 23146U 94037B 94188.90482083 .01496196 82728-5 39102-3 0 158
2 23146 62.9524 330.5471 0093490 142.8860 217.8904 16.17205107 745
1994037C
1 23147U 94037C 94185.11680924 .18610368 79021-5 17072-2 0 74
2 23147 62.8788 345.6423 0053206 143.4203 218.5277 16.31721982 134
```

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1994038A
1 23168U 94038A 94188.64427760 -.00000168 00000-0 10000-3 0 25
2 23168 2.3741 293.1616 0004554 139.9051 83.3533 0.99089534 16
1994038B
1 23169U 94038B 94188.97115014 .02057633 12233-4 29802-3 0 56
2 23169 51.6468 288.4405 0005867 295.2407 64.7988 16.33843387 164
1994038C
1 23170U 94038C 94189.02996696 .16894393 12672-4 22210-3 0 104
2 23170 51.6338 288.0859 0001025 44.2765 315.8363 16.49395276 176
1994038D
1 23171U 94038D 94188.01943810 -.00000130 00000-0 10000-3 0 17
2 23171 2.2872 292.3023 0017415 8.7584 351.9008 0.99409051 01
1994038E
1 23172U 94038E 94188.74190940 -.00000061 00000-0 10000-3 0 20
2 23172 47.9234 292.1204 7280906 0.1447 359.8712 2.25204377 8953
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

1002. STS-65 Orbital State Vector Rev #5

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 10:43:48 UTC
From: astroman@netcom.com
Message-ID: <astromanCso5t1.HB9@netcom.com>
Source record: 27304
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94189.79230006944
07/08/1994 19:00:54.726 UTC
EFG E: 11204373.21 ft
F: 15768054.36 ft
G: -10300272.16 ft
Edot: -20043.4317 ft/s
Fdot: 12949.8134 ft/s
Gdot: -1969.5132 ft/s
ndot/2 (drag): 0.00033846733 rev/day^2
nddt/6: 4.80752E-09 rev/day^3
Bstar: 1.06058E-04 1/Earth Radii
Elset #: 5
Rev @ Epoch: 5.72395390955

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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1003. subscribe

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 11:59:34 UTC
From: hnelson@facstaff.wisc.EDU
Message-ID: <21577.hnelson@facstaff.wisc.edu>
Source record: 27305

```
subscribe
hnelson@facstaff.wisc.edu
```

1004. STS-65 Orbital State Vector Rev #13

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 20:46:32 UTC
From: astroman@netcom.com
Message-ID: <astromanCsoxpK.HtF@netcom.com>
Source record: 27306
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94190.45882538194
07/09/1994 11:00:42.513 UTC
EFG E: 16032041.17 ft
F: 12169101.21 ft
G: 8647762.40 ft
Edot: -11459.7028 ft/s
Fdot: 19925.3736 ft/s
Gdot: -6766.2331 ft/s
ndot/2 (drag): 0.00081090896 rev/day^2
nddt/6: 2.75972E-08 rev/day^3
Bstar: 2.55671E-04 1/Earth Radii
Elset #: 6
Rev @ Epoch: 13.34449974588

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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1005. ARLK027 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-07-09 21:21:36 UTC
From: w1aw@arrl.org
Message-ID: <$arlk027.1994@ampr.org>
Source record: 27307
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK027
ARLK027 Keplerian data

ZCZC SK94
QST de W1AW
Keplerian Bulletin 27 ARLK027
From ARRL Headquarters
Newington, CT July 9, 1994
To all radio amateurs

SB KEP ARL ARLK027
ARLK027 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 23173U 94039A 94189.75128031 .00052344 00000-0 15762-3 0 48
2 23173 28.4677 7.2844 0002774 310.5683 74.7426 15.90196095 20
AO-10
1 14129U 83058B 94176.41110075 -.00000306 00000-0 10000-3 0 2893
2 14129 27.0856 321.0039 6024383 189.2195 150.8337 2.05882336 54986
RS-10/11
1 18129U 87054A 94187.82828537 .00000033 00000-0 20156-4 0 9249
2 18129 82.9250 314.3214 0011550 338.1080 21.9579 13.72339007352606
UO-11
1 14781U 84021B 94186.07267686 .00000122 00000-0 28448-4 0 7056
2 14781 97.7857 199.9598 0010908 209.5355 150.5234 14.69226745552933
RS-12/13
1 21089U 91007A 94186.51538083 .00000026 00000-0 10881-4 0 7053
2 21089 82.9194 357.8515 0030918 58.0299 302.3847 13.74043103171162
AO-13
1 19216U 88051B 94180.17114065 -.00000492 00000-0 10000-4 0 9269
2 19216 57.7928 244.7541 7213733 344.7303 1.9030 2.09725008 14760
UO-14
1 20437U 90005B 94185.22963909 .00000009 00000-0 20566-4 0 79
2 20437 98.5890 269.7744 0011398 136.9991 223.2086 14.29848391232027
AO-16
1 20439U 90005D 94187.10391636 .00000016 00000-0 23065-4 0 8064
2 20439 98.5965 272.8750 0011799 132.7023 227.5147 14.29902664232309
```

```
DO-17
1 20440U 90005E 94186.77654850 .00000014 00000-0 22218-4 0 8065
2 20440 98.5979 272.8817 0011862 132.7562 227.4620 14.30042144232270
WO-18
1 20441U 90005F 94185.21288967 .00000008 00000-0 20089-4 0 8085
2 20441 98.5985 271.3372 0012255 137.8043 222.4091 14.30016126232059
LO-19
1 20442U 90005G 94187.77859823 .00000017 00000-0 23294-4 0 8052
2 20442 98.5996 274.1338 0012634 129.7145 230.5152 14.30112885232438
FO-20
1 20480U 90013C 94184.97566234 -.00000020 00000-0 35514-4 0 7033
2 20480 99.0371 333.6238 0540509 301.5076 53.4288 12.83226012206283
AO-21
1 21087U 91006A 94187.32341330 .00000094 00000-0 82657-4 0 4868
2 21087 82.9440 128.5539 0037000 31.5792 328.7574 13.74542337172215
UO-22
1 21575U 91050B 94185.75312930 .00000006 00000-0 16504-4 0 5095
2 21575 98.4342 259.8954 0006811 235.8685 124.1854 14.36921919155604
KO-23
1 22077U 92052B 94185.26723086 -.00000037 00000-0 10000-3 0 4043
2 22077 66.0823 244.2195 0014697 282.7245 77.2124 12.86287015 88985
KO-25
1 22830U 93061H 94188.19631415 -.00000015 00000-0 11300-4 0 3084
2 22830 98.5532 260.8802 0012308 115.3619 244.8834 14.28059134 40559
IO-26
1 22826U 93061D 94188.19029709 .00000008 00000-0 20926-4 0 3036
2 22826 98.6524 263.8369 0009331 147.0437 213.1333 14.27732719 40547
AO-27
1 22825U 93061C 94189.19195787 .00000002 00000-0 18744-4 0 3035
2 22825 98.6530 264.7903 0008832 142.2484 217.9324 14.27628430 40682
PO-28
1 22829U 93061G 94189.18276353 .00000019 00000-0 25524-4 0 2960
2 22829 98.6494 264.8485 0010632 131.5749 228.6356 14.28032336 40697
Arsene
1 22654U 93031B 94188.21304092 -.00000116 00000-0 00000+0 0 2649
2 22654 1.8958 98.1428 2918247 185.7752 169.5951 1.42202950 1486
Mir
1 16609U 86017A 94188.87297113 .00002144 00000-0 36545-4 0 6694
2 16609 51.6476 82.9139 0002397 119.8750 240.2481 15.56467908 28188

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
July 12, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1006. SAREX Status 7/10 at 1:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-07-10 01:08:54 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.002.1994@ampr.org>
Source record: 27308
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.002
SAREX Status 7/10 at 1:00 UTC

Silver Spring, MD, July 10 1994 at 1:00 UTC

At approximately 22:30 into the flight of STS-65, the Shuttle Amateur Radio Experiment was set up and activated. One orbit later, as the Shuttle passed over the southern portion of the US, the Bair Middle School in Sunrise Florida had an opportunity to chat with Commander Bob Cabana, KC5HBV. During the conversation, he looked out the window and reported seeing partly cloudy weather as he passed over Florida. The Bair Middle school had an outstanding horizon-to-horizon contact. The team at the school reported that 22 students talked with Commander Cabana during their contact opportunity.

Gil Carman from the JSC ARC reports that element set JSC-004 varied from the orbit 16 state vector by 15 seconds. A new element set, JSC-005 has been generated and is provided below.

STS-65
1 23173U 94105A 94190.62548630 .00052344 00000-0 15762-3 0 52
2 23173 28.4641 0.7490 0002728 316.9968 43.0429 15.90169039 166

Satellite: STS-65
Catalog number: 23173
Epoch time: 94190.62548630 = (09 JUL 94 15:00:42.01 UTC)
Element set: 005
Inclination: 28.4641 deg
RA of node: 0.7490 deg Space Shuttle Flight STS-65
Eccentricity: .0002728 Keplerian element set JSC-005
Arg of perigee: 316.9968 deg from NASA flight Day 2 vector
Mean anomaly: 43.0429 deg
Mean motion: 15.90169039 rev/day G. L. Carman
Decay rate: 5.2344e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 16
Checksum: 293

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

1007. STS-65 Element Set (94190.625)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-10 01:45:51 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94190.625@alsys.com>
Source record: 27309
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94105A 94190.62548630 .00052344 00000-0 15762-3 0 52
2 23173 28.4641 0.7490 0002728 316.9968 43.0429 15.90169039 166

Satellite: STS-65
Catalog number: 23173
Epoch time: 94190.62548630 = (09 JUL 94 15:00:42.01 UTC)
Element set: 005
Inclination: 28.4641 deg
RA of node: 0.7490 deg Space Shuttle Flight STS-65
Eccentricity: .0002728 Keplerian element set JSC-005
Arg of perigee: 316.9968 deg from NASA flight Day 2 vector
Mean anomaly: 43.0429 deg
Mean motion: 15.90169039 rev/day G. L. Carman
Decay rate: 5.2344e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 16

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1008. STS-65 Orbital State Vector Rev #28

Newsgroup: rec.radio.amateur.space
Date: 1994-07-10 14:29:21 UTC
From: astroman@netcom.com
Message-ID: <astromanCsqAwx.Mv4@netcom.com>
Source record: 27311
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94191.50291104167
07/10/1994 12:04:11.514 UTC
EFG E: -11117241.19 ft
F: -18840810.31 ft
G: -1136785.32 ft
Edot: 17541.8935 ft/s
Fdot: -11066.0217 ft/s
Gdot: 12026.3519 ft/s
ndot/2 (drag): 0.00081771014 rev/day^2
nddt/6: 2.80587E-08 rev/day^3
Bstar: 2.55347E-04 1/Earth Radii
Elset #: 8
Rev @ Epoch: 28.98275947893

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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1009. STS-65 Element Set (94191.629)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-10 17:15:51 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94191.629@alsys.com>
Source record: 27312
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94105A 94191.62949203 .00064328 00000-0 21757-3 0 61
2 23173 28.4654 353.2447 0002401 329.9288 30.1191 15.90390986 323

Satellite: STS-65
Catalog number: 23173
Epoch time: 94191.62949203 = (10 JUL 94 15:06:28.11 UTC)
Element set: 006
Inclination: 28.4654 deg
RA of node: 353.2447 deg Space Shuttle Flight STS-65
Eccentricity: .0002401 Keplerian element set JSC-006
Arg of perigee: 329.9288 deg from NASA flight Day 3 vector
Mean anomaly: 30.1191 deg
Mean motion: 15.90390986 rev/day G. L. Carman
Decay rate: 6.4328e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 32

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1010. ANS-190 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-07-10 18:12:25 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-190.01.1994@ampr.org>
Source record: 27313
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-190.01
UNAMSAT-1 LAUNCH DELAYED

HR AMSAT NEWS SERVICE BULLETIN 190.01 FROM AMSAT HQ
SILVER SPRING, MD JULY 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-190.01

XE1TU Reports That the UNAMSAT-1 Launch Delayed Until September '94

David Liberman (XE1TUU) reports that the UNAMSAT-1 MICROSAT launch has been postponed until early September '94. Originally, XE1TU expected to have UNAMSAT-1 launched into orbit around 15-JUNE-94 aboard a Soviet re-furbished ICBM. This latest delay came one day before XE1TU and his team were supposed to leave for Moscow. The apparent reason for the delay is due to the conflicting vacation schedules of civilian and military personel at the launch site. XE1TU recently received an official letter from Soviet officials explaining this postponement. XE1TU was encouraged by this communication because it means that launch will definitely happen now. In the meantime, UNAMSAT-1 team are working hard to "fine-tune" all the software for the satellite. Except for working some minor software issues, the Bulletin Board System (BBS) software is currently being tested "real-time" by radio amateurs in the local area. UNAMSAT-1 will have a BBS similar to AO-16, LO-19, and IO-26. Inaddition to the BBS, UNAMSAT-1 will carry a scientific payload to detect the velocity and direction of "micro-meteorites." Please stay tuned to the AMSAT News Service (ANS) bulletins for further information about the launch status of UNAMSAT-1.

[The AMSAT News Service (ANS) would like to thank David Liberman (XE1TU) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-190.02
STS-65 SAREX MISSION BEGINS

HR AMSAT NEWS SERVICE BULLETIN 190.02 FROM AMSAT HQ
SILVER SPRING, MD JULY 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-190.02

STS-65 SAREX Mission Begins!

The Space Shuttle Columbia roared into the blue skies of the Kennedy Space Center on Friday, 08-JULY-94 as the second International Microgravity Laboratory Mission (IML-02) began. The near flawless launch countdown sequence resulted in an on-time launch of the STS-65 mission at 16:43 UTC.

The seven member crew of STS-65 will spend 14 days on-orbit. Two of the crew members are ham radio operators. They are Shuttle Commander Robert Cabana, (KC5HBV who was just licensed) and Don Thomas (KC5FVF). The two will operate the Shuttle Amateur Radio Experiment (SAREX). SAREX is a secondary mid-deck payload that allows ham radio operators and school students the opportunity to talk to the astronauts while they are in orbit. Ground based amateur radio operators can communicate with the two astronaut hams through packet radio and, when time permits, via voice contacts. Thirteen scheduled school group contacts with students in the US, Germany, and Japan are also planned.

At approximately 22:30 Mission Elapsed Time (MET) into the flight of STS-65, the Shuttle Amateur Radio Experiment was set up and activated. One orbit later, as the Shuttle passed over the southern portion of the US, the Bair Middle School in Sunrise Florida had an opportunity to chat with Commander Bob Cabana (KC5HBV). During the conversation, he looked out the window and reported seeing partly cloudy weather as he passed over Florida. The Bair Middle school had an outstanding "horizon-to-horizon" contact. The team at the school reported that 22 students talked with Commander Cabana during their contact opportunity.

The following is the latest keplerian element set for STS-65. Monitor the WA3NAN Shuttle re-broadcast frequencies and daily ARRL bulletins to pick up the latest element sets. The following are the frequencies for the re-broadcasts:

Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland, SAREX Bulletins and Shuttle Retransmissions 3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz and 147.45 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT SAREX News Bulletins 3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz and 147.555 MHz (FM)

Also, bulletins available on INTERNET, via AMSAT News Service (ANS) bulletins, Compuserve, and many of our local Packet Radio BSS.

The following is a summary of the frequencies that the Shuttle astronauts will use during SAREX operations:

All operations in split mode. Do not transmit on the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks : 144.91, 144.93, 144.95, 144.97, 144.99 MHz (Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Packet Freqs: Downlink: 145.55 MHz
Uplink : 144.49 MHz

Note: The crew will not favor any specific uplink frequency, so your ability to work the crew will be the "luck of the draw."

STS-65
1 23173U 94105A 94191.62949203 .00064328 00000-0 21757-3 0 61

2 23173 28.4654 353.2447 0002401 329.9288 30.1191 15.90390986 323

Satellite: STS-65
Catalog number: 23173
Epoch time: 94191.62949203 = (10-JUL-94 15:06:28.11 UTC)
Element set: 006
Inclination: 28.4654 deg
RA of node: 353.2447 deg Space Shuttle Flight STS-65
Eccentricity: .0002401 Keplerian element set JSC-006
Arg of perigee: 329.9288 deg from NASA Flight Day 3 vector
Mean anomaly: 30.1191 deg
Mean motion: 15.90390986 rev/day G. L. Carman (WA5NOM)
Decay rate: 6.4328e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 32
Checksum: 298

[The AMSAT News Service (ANS) would like to thank Frank Bauer and the SAREX Working Group for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-190.03
APOLLO 11 SPECIAL EVENT STATIONS

HR AMSAT NEWS SERVICE BULLETIN 190.03 FROM AMSAT HQ
SILVER SPRING, MD JULY 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-190.03

Apollo 11 25th Anniversary Amateur Radio Special Event Station Activity

At 16:27 EDT, Sunday afternoon, July 20, 1969, astronaut Neil A. Armstrong spoke the words "Houston, Tranquility Base here. The Eagle has landed." At 22:56 EDT, later the same day, Armstrong stepped down from the ladder of the Lunar Module onto the Moon's surface and spoke the words, "That's one small step for a man, one giant leap for mankind."

To commemorate that historic event twenty-five years ago next week, amateur radio clubs and groups at NASA Headquarters and the various NASA field centers will be on the air as "Special Event Stations", contacting amateur radio operators around the world.

Amateur Radio clubs or groups from twelve NASA locations are currently preparing for the 60-hour special event operating period from their respective facilities. Ham groups from other NASA locations may also be on-line to participate by the time the special event period arrives. This is the first time so many NASA stations will be represented on the air at one time. Contacts with these stations during the special event period will be confirmed on request with a certificate to commemorate man's first steps on the Moon and the special event activity.

Details:

Event Name:
Apollo 11 Moon Landing 25th Anniversary

Date/Time Period:
17:00Z, July 19 through 05:00Z, July 22
(13:00 EDT, July 19 through 01:00, July 22)

Modes:
CW, SSB, FM, Packet, Pactor, Amtor, RTTY, SSTV, ATV, Satellites.

Frequencies:
HF CW/SSB: Check 11 (as in Apollo 11) kHz up from the bottom of
the General Class portion of the amateur radio bands (except 10m SSB:
28.411+ MHz).

Other Modes:
Check modes/frequencies as indicated by the individual stations
below.

QSL Information:
A certificate is being designed to commemorate this special event
activity, which will be individualized for each special event
station.

Domestic Stations: Send a 9" x 12" self-addressed, stamped envelope
to the callbook address (CBA) of the station worked or to the address
specified by the station worked. Attach $0.52 postage to cover return
mailing.

DX Stations: Send a 9" x 12" self-addressed envelope to the
appropriate address, with sufficient IRC's or U.S. Postage for return
mailing of up to 1.5 oz (42.52 grams).
Europe = $1.40US postage (3 IRC);
Mexico = $0.63US postage (2 IRC);
Canada = $0.55US (2 IRC).

Individual Station Specifics:
==========

Ames Amateur Radio Club,
NASA Ames Research Center, Moffett Field, CA
Callsign: K6MF
Bands: 40-10m (excl. WARC), 2m
Modes: CW, SSB, FM
Special Freqs: 145.585 MHz
QSL Address: AARC
Box 73
Moffett Field, CA 94035-1000

Dryden Amateur Radio Club,
NASA Dryden Flight Research Center, Edwards, CA
Callsign: KF7GD
Bands: 80-10m (incl WARC), 2m
Modes: CW, SSB

Special Freqs: 2m SSB: 144.25 MHz; FM: 146.55 MHz
QSL Address: NASA DFRC
Attn: Dryden ARC
POB 273
Edwards, CA 93523

Goddard Amateur Radio Club, Inc.,
NASA Goddard Space Flight Center, Greenbelt, MD
Callsign: WA3NAN
Bands: 160-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m: 146.58 FM Simplex
QSL Address: Callbook Address, or
GARC
P.O. Box 86
Greenbelt, MD 20768-0086

Guam Contingency Landing Site Amateur Radio Group Guam
Callsign: KC4YDP/KH2
Bands: 80-10m (incl WARC)
Modes: CW, SSB
Special Freqs:
QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Headquarters Amateur Radio Group
Washington, D.C.
Callsign: N4ZR
Bands: 80-10 (incl WARC)
Modes: CW, SSB
Special Freqs:
QSL Address: CBA or
N4ZR
2003 Sarazen Place
Reston, VA 22091-3809

Jet Propulsion Laboratory Amateur Radio Club and
Goldstone Amateur Radio Club
Jet Propulsion Laboratory, Pasadena, CA
Callsign: W6VIO
Bands: 80-10 (incl WARC), 2m
Modes: CW, SSB, Amtor, Packet, RTTY, Pactor
Special Freqs: SSTV: 14.230 MHz
Packet Node/BBS (W6VIO-1):
144.090/223.540 MHz
2m Repeaters (freq in MHz):
(W6VIO) 147.15+/224.72-
(WB6TZS)145.28-/223.96-/447.325-
Satellites: AO10/13/LEOS SSB/CW
QSL Address: Jet Propulsion Laboratory Amateur Radio

Club
M/S 168-327
4800 Oak Grove Dr.
Pasadena, Ca. 91109

Johnson Space Center Amateur Radio Club
NASA Johnson Space Center, Houston, TX
Callsign: W5RRR
Bands: 80-10 (incl WARC), 2m, 70cm
Modes: CW, SSB, FM, Digital Modes,
SSTV, ATV, Satellites
Special Freqs: 2m repeaters
QSL Address: JSC ARC/W5RRR
Johnson Space Center
Houston, Texas 77058
BBS: (713)244-5625

Kennedy Space Center Amateur Radio Group
Kennedy Space Center, FL
Callsign: KC4TCV (SSB) / AD4NA (CW)
Bands: 160-10m (incl WARC)
Modes: CW, SSB, Pactor, RTTY, Satellites
Special Freqs: Packet: 145.09 MHz;
2m Repeater 146.34/.94, 146.31/.91,
146.96/.36
QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Lewis Amateur Radio Club (NLARC)
NASA Lewis Research Center, Cleveland, OH
Callsign: AK8Y
Bands: 80-10m
Modes: CW, SSB, RTTY, Amtor, Pactor, FM,
Satellites
Special Freqs: Repeaters: 147.195+/444.1 MHz
RTTY: 14.080-90MHz
Amtor/Pactor: 14.060-80MHz.
Packet: 145.01MHz (call: AK8Y-8)
QSL Address: NASA Lewis Amateur Radio Club
21000 Brookpark Rd, MS 54-6
Cleveland, OH 44135
Attn: Don Hilderman

Marshall Amateur Radio Club
NASA Marshall Space Flight Center, Huntsville, AL
Callsign: WA4NZD
Bands: 160-6m (incl WARC)
Modes: Primarily SSB
Special Freqs: 6m: 50.130 MHz; Oscar 13, Mode B
QSL Address: Marshall Amateur Radio Club

CM21X
MSFC, AL 35812
Phone Message: (205)544-7568

Stennis Space Center Amateur Radio Club
NASA Stennis Space Center, MS
Callsign: K5GY
Bands: 40-10m (no WARC), 2m
Modes: CW, SSB, Novice Bands, Packet
Special Freqs: 2m repeater: 146.70 MHz
QSL Address: Stennis Space Center Amateur Radio Club
Bldg 1201
Stennis Space Center, MS 39529

Wallops Island Amateur Radio Club
NASA Wallops Flight Facility, Wallops Island, VA
Callsign: KE3ND
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs: 2m: 147.55MHz simplex
QSL Address: Wallops Island ARC
NASA Wallops Flight Facility
Building E-134
Wallops Island, VA 23337

White Sands Complex Amateur Radio Group
NASA White Sands Test Facility, Las Cruces, NM
Callsign: KF7E
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs:
QSL Address: KF7E
P.O. Box 627
Organ, NM 88052

[The AMSAT News Service (ANS) would like to thank the W5BWF for this information. W5BWF can be reached at his CompuServe address of 71575,1677]

/EX
SB SAT @ AMSAT $ANS-190.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 190.05 FROM AMSAT HQ
SILVER SPRING, MD JULY 9, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-190.05

Weekly OSCAR Status Reports: 09-JUL-94

AO-13: Current Transponder Operating Schedule:
L QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 May 07-Jul 11
Mode-B : MA 0 to MA 170 |
Mode-BS : MA 170 to MA 218 |

Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-BS : MA 230 to MA 250 | Alon/Alat 230/-5
Mode-B : MA 250 to MA 256 |
Omnis : MA 250 to MA 120 | Move to attitude 180/0, Jul 11

L QST de G3RUH 1994 Jul 05. Magnetorquing from attitude 243/+5 to 180/0 commences on Jul 07 [Thu] 05:10 UTC, Orbit #4642/224, and continues for 10+ perigees. Estimated interim attitudes are: Orbit Alon/Alat: 4643 235/+4: 4645 221/-2: 4647 211/-10: 4649 205/-10: 4651 193/-12: 4653 181/-13, then a final adjustment. For command purposes during this 4-day period Mode-S beacon is ON MA 140-150, i.e. Mode-B OFF for 26 mins. The new schedule will start orbit 4651 MA 150 Jul 11 [Mon] 08:51 UTC. Magnetorquing (attitude changing) is not an exact science, and minor deviations from the above plan sometimes occurs. Please don't rely on gossip and rumor! Continuous up-to-date information about AO-13 operations is always available on the beacons, 145.812 MHz or 2400.664 MHz in CW, RTTY and 400 bps PSK. These bulletins are also posted to Internet, ANS, Packet, PacSats etc., and many international newsletters. A 400 bps PSK decoder is available from G3RUH and several DSP products; display software P3C.EXE etc. from many AMSAT groups. The active command stations are listed below, and constructive feedback about operations is always welcome.

Peter DB2OS @ DB0FAU.#NDS.DEU.EU
James G3RUH @ GB7DDX.#22.GBR.EU
Graham VK5AGR @ VK5WI.#ADL.#SA.AUS.OC
The above may also be reached via Internet (callsign@amsat.org) and KO-23. Please remember to state clearly a return address.
[G3RUH/DB2OS/VK5AGR]

MIR: The new Soyuz flight has the following 2 cosmonauts boarding Mir as Crew #16: Yurij Malenchenko (R0MIR) & Talgat Musabaeyv (R0MIR). They will be joining Valerij Polyakov (U3MIR) who is attempting to break the manned space flight endurance record. The call signs for the new cosmonauts (R0MIR) are generic for the Mir, so don't be surprised if the call sign should change in the near future. The crew that will be leaving Mir is Viktor Afanasiev (U9MIR) and Yurij Usachev (R3MIR). This information comes from Serge Samburov, Space "MIR" QSL Manager Chief of Cosmonaut Amateur Radio Department NPO "Energia." All Mir contact QSLs should be sent directly to Serge at: P.O. Box 73, Kaliningrad-10 city, Moscow Area, 141070, RUSSIA.
[N2WWD]

DO-17: DO-17 still continues to transmit its voice message on a downlink frequency of 145.825 MHz.

KO-25: There have been several reports showing up on the KO-25 BBS that apparently the NASA 2-line elements are not correct. It seems that they are the elements of a satellite that is within close proximity of KO-25. This problem was first noted by W5RKN and after posting a message to the BBS of KO-25 several operators replied that they also have noted the same problem. All KO-25 users are asked to

keep monitoring this problem while inquiries are being made are
made about correcting the keps for KO-25. [W5RKN]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1011. STS-65 Orbital State Vector Rev #36

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 01:19:50 UTC
From: astroman@netcom.com
Message-ID: <astromanCsr512.8oB@netcom.com>
Source record: 27315
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 7
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94191.92595069444
07/10/1994 22:13:22.139 UTC
ECI X: -2016.165 km
Y: -5544.203 km
Z: -3133.831 km
Xdot: 7.342897 km/s
Ydot: -2.321350 km/s
Zdot: -0.613999 km/s
ndot/2 (drag): 0.00081627583 rev/day^2
nddt/6: 2.79587E-08 rev/day^3
Bstar: 2.53625E-04 1/Earth Radii
Elset #: 9
Rev @ Epoch: 36.72332321232

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1012. SAREX Status 7/11 at 2:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 02:39:52 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.003.1994@ampr.org>
Source record: 27314
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.003
SAREX Status 7/11 at 2:30 UTC

Silver Spring, MD, July 11 1994 at 2:30 UTC

The Shuttle Amateur Radio Experiment (SAREX) packet robot was activated today. Several stationsmade packet connects immediately after activation. At present, at least 84 packet connects have been confirmed. The SAREX packet callsign is W5RRR-1. The uplink frequency is 144.49 MHz and the downlink is 145.55 MHz.

At 2/1:33 MET (18:16 UTC) the Sacred Hearts Academy in Honolulu, Hawaii had a 4 minute school group pass with the Space Shuttle Columbia. 8 students talked to STS-65 Mission Commander Bob Cabana, KC5HBV.

The official element set for today is JSC-006. This element set was provided courtesy of Gil Carman, WA5NOM, from the JSC ARC.

STS-65
1 23173U 94105A 94191.62949203 .00064328 00000-0 21757-3 0 61
2 23173 28.4654 353.2447 0002401 329.9288 30.1191 15.90390986 323

Satellite: STS-65
Catalog number: 23173
Epoch time: 94191.62949203 = (10 JUL 94 15:06:28.11 UTC)
Element set: 006
Inclination: 28.4654 deg
RA of node: 353.2447 deg Space Shuttle Flight STS-65
Eccentricity: .0002401 Keplerian element set JSC-006
Arg of perigee: 329.9288 deg from NASA flight Day 3 vector
Mean anomaly: 30.1191 deg
Mean motion: 15.90390986 rev/day G. L. Carman
Decay rate: 6.4328e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 32
Checksum: 298

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

1013. GARC Shuttle Communications Retransmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 11:13:35 UTC
From: Erich Franz Stocker <stocker@spsosun.gsfc.nasa.gov>
Message-ID: <2vr9gv$eo8@paperboy.gsfc.nasa.gov>
Source record: 27317
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

INTERESTED IN STS-65 SHUTTLE TRANSMISSIONS
The Goddard Amateur Radio Club (GARC) invites interested people to tune
in to
STS-65 shuttle ground communications transmissions. As a public service
to the
Amateur radio community, the GARC retransmits space shuttle air-to-ground
communications. During the STS-65 mission which also carries a Shuttle
Amateur Radio Experiment (SAREX), Amateur radio operators, shortwave
listeners,
and individuals with scanners can listen to these communications on the
following HF (single sideband) and VHF (FM) frequencies:

3.860 MHz (lower sideband)
7.186 MHz (lower sideband)
14.295 MHz (upper sideband)
21.395 MHz (upper sideband)
28.650 MHz (upper sideband)
147.45 MHz (FM) in local Washington D.C. metro area

As previous posts have indicated STS-65 also carries SAREX.

Packet Radio
Callsign: W5RRR-1

Freqs: All operations in split mode. Do NOT transmit
on the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (worldwide)
Uplinks: 144.91,144.95,144.97,144.99 MHz

Crew will not favor any specific frequency

Packet Freq: Downlink: 145.55 MHz
Uplink: 144.49 MHz

Info: Goddard Amateur Radio Club, WA3NAN

****
* Erich Franz Stocker *
* N3OXM *
* stocker@spsosun.gsfc.nasa.gov *
* *
* My ideas are my own and do not represent*
* the opinions of the federal government, *
* NASA or Goddard Space Flight Center. *
****

1014. Re: Sat Logging

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 12:14:03 UTC
From: "Colin R. Wright" <lifeform@delphi.com>
Message-ID: <R8wTK+L.lifeform@delphi.com>
Source record: 27318

I usually just log the frequency as "AO-10/B" or "FO-20/JA" and then keep the mode as it would normally be (SSB, FM, etc.). This makes it nice for computer logging, as I can search the frequency field for a "/" and find all my satellite contacts easily.

1015. SAREX Rise/Set Times 7/11

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 14:04:49 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.004.1994@ampr.org>
Source record: 27316
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.004
STS-65 Eastern R/S Times 07/11

Below are the rise and set times for STS-65 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

New York City
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 13:59:01 14:02:19 14:05 6 A-E 47
11Jul94 15:34:09 15:37:22 15:40 5 D-W 48

12Jul94 14:06:28 14:09:51 14:12 6 D-W 63

13Jul94 12:39:01 12:42:13 12:44 5 A-E 78
13Jul94 14:13:59 14:17:16 14:20 6 D-W 79

14Jul94 12:46:16 12:49:31 12:52 6 D-E 94

Washington D.C.
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 13:58:00 14:01:41 14:04 8 A-E 47
11Jul94 15:33:07 15:36:50 15:40 9 D-W 48

12Jul94 12:30:55 12:34:08 12:36 5 A-E 62
12Jul94 14:05:29 14:09:15 14:12 9 D-E 63
12Jul94 15:40:57 15:44:24 15:47 7 D-W 64

13Jul94 12:38:06 12:41:34 12:44 8 A-E 78
13Jul94 14:12:59 14:16:43 14:19 9 D-W 79

14Jul94 12:45:16 12:48:54 12:52 9 D-E 94
14Jul94 14:20:36 14:24:03 14:27 8 D-W 95

Atlanta, GA
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 12:21:08 12:24:34 12:27 7 A-E 46
11Jul94 13:55:30 13:59:51 14:03 19 A-E 47
11Jul94 15:30:48 15:35:18 15:39 26 D-W 48
11Jul94 17:06:29 17:10:43 17:14 16 D-W 49

12Jul94 12:28:19 12:32:10 12:35 11 A-E 62
12Jul94 14:03:12 14:07:32 14:11 24 A-E 63
12Jul94 15:38:34 15:43:00 15:46 23 D-W 64
12Jul94 17:14:29 17:18:22 17:21 10 D-W 65

13Jul94 11:01:21 11:04:27 11:07 5 A-E 77
13Jul94 12:35:33 12:39:42 12:43 17 A-E 78
13Jul94 14:10:45 14:15:08 14:19 26 D-E 79
13Jul94 15:46:17 15:50:34 15:54 18 D-W 80
13Jul94 17:22:38 17:25:50 17:28 5 D-W 81

14Jul94 11:08:00 11:11:48 11:15 10 A-E 93
14Jul94 12:42:51 12:47:08 12:50 22 A-E 94
14Jul94 14:18:15 14:22:36 14:26 24 D-W 95
14Jul94 15:53:59 15:57:59 16:01 12 D-W 96

Miami, FL
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 12:20:15 12:24:44 12:28 37 A-E 46
11Jul94 13:55:53 14:00:28 14:04 56 A-W 47
11Jul94 15:31:42 15:36:22 15:40 45 D-E 48
11Jul94 17:07:29 17:12:11 17:16 70 D-W 49
11Jul94 18:43:35 18:47:42 18:51 14 D-W 50

12Jul94 10:52:49 10:56:58 11:00 15 A-E 61
12Jul94 12:27:57 12:32:32 12:36 74 A-E 62
12Jul94 14:03:48 14:08:21 14:12 44 D-W 63
12Jul94 15:39:34 15:44:16 15:48 58 D-E 64
12Jul94 17:15:22 17:19:57 17:24 34 D-W 65
12Jul94 18:52:03 18:55:22 18:58 6 D-W 66

13Jul94 11:00:10 11:04:34 11:08 29 A-E 77
13Jul94 12:35:40 12:40:15 12:44 65 A-W 78
13Jul94 14:11:35 14:16:08 14:20 43 D-E 79
13Jul94 15:47:17 15:52:00 15:56 86 D-E 80
13Jul94 17:23:16 17:27:33 17:31 18 D-W 81

14Jul94 09:32:38 09:36:35 09:40 11 A-E 92
14Jul94 11:07:33 11:12:05 11:16 58 A-E 93
14Jul94 12:43:20 12:47:53 12:51 47 A-W 94
14Jul94 14:19:13 14:23:47 14:27 52 D-E 95
14Jul94 15:54:55 15:59:32 16:03 44 D-W 96
14Jul94 17:31:19 17:34:59 17:38 8 D-W 97

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-65.005
STS-65 Central R/S Times 07/11

Below are the rise and set times for STS-65 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Chicago, IL
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 15:31:29 15:34:36 15:37 5 D-E 48

13Jul94 14:11:33 14:14:30 14:16 5 D-E 79

14Jul94 14:18:51 14:21:46 14:24 5 D-W 95

Huntsville, AL
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 13:55:14 13:59:25 14:03 15 A-E 47
11Jul94 15:30:24 15:34:48 15:38 21 D-W 48
11Jul94 17:06:01 17:10:11 17:13 14 D-W 49

12Jul94 12:28:05 12:31:47 12:34 8 A-E 62
12Jul94 14:02:51 14:07:05 14:10 19 A-E 63
12Jul94 15:38:08 15:42:29 15:46 19 D-W 64

12Jul94 17:14:01 17:17:48 17:21 10 D-W 65

13Jul94 12:35:19 12:39:17 12:42 13 A-E 78
13Jul94 14:10:22 14:14:39 14:18 21 D-E 79
13Jul94 15:45:49 15:50:02 15:53 16 D-W 80
13Jul94 17:22:08 17:25:16 17:27 5 D-W 81

14Jul94 11:07:57 11:11:25 11:14 7 A-E 93
14Jul94 12:42:32 12:46:41 12:50 17 A-E 94
14Jul94 14:17:50 14:22:05 14:25 20 D-W 95
14Jul94 15:53:30 15:57:26 16:00 11 D-W 96

Houston, TX
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 12:18:28 12:21:51 12:24 6 A-E 46
11Jul94 13:52:49 13:57:12 14:01 26 A-E 47
11Jul94 15:28:07 15:32:49 15:37 62 A-E 48
11Jul94 17:03:49 17:08:30 17:12 52 D-W 49
11Jul94 18:39:42 18:44:01 18:47 18 D-W 50

12Jul94 12:25:26 12:29:29 12:33 13 A-E 62
12Jul94 14:00:26 14:04:57 14:08 41 A-E 63
12Jul94 15:35:56 15:40:38 15:44 66 D-E 64
12Jul94 17:11:40 17:16:15 17:20 35 D-W 65
12Jul94 18:47:50 18:51:41 18:55 10 D-W 66

13Jul94 12:32:45 12:37:02 12:40 22 A-E 78
13Jul94 14:08:03 14:12:37 14:16 57 A-E 79
13Jul94 15:43:44 15:48:18 15:52 57 D-W 80
13Jul94 17:19:27 17:23:51 17:27 22 D-W 81

14Jul94 11:05:16 11:09:06 11:12 10 A-E 93
14Jul94 12:40:04 12:44:32 12:48 35 A-E 94
14Jul94 14:15:36 14:20:11 14:24 66 D-E 95
14Jul94 15:51:19 15:55:50 15:59 41 D-W 96
14Jul94 17:27:15 17:31:17 17:34 13 D-W 97

Denver, CO
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 15:27:39 15:31:02 15:33 6 A-E 48
11Jul94 17:02:31 17:06:08 17:09 8 D-W 49

12Jul94 15:35:00 15:38:35 15:41 8 A-E 64
12Jul94 17:10:16 17:13:42 17:16 7 D-W 65

13Jul94 14:07:42 14:10:56 14:13 6 A-E 79
13Jul94 15:42:31 15:46:01 15:49 8 D-W 80
13Jul94 17:18:05 17:21:07 17:23 5 D-W 81

14Jul94 14:14:50 14:18:14 14:21 7 A-E 95
14Jul94 15:49:57 15:53:21 15:56 7 D-W 96

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-65.006
STS-65 Western R/S Times 07/11

Below are the rise and set times for STS-65 for selected US cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Seattle, WA
STS-65 Element Set JSC-06

no visible passes

Albuquerque, NM
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 13:52:06 13:55:15 13:57 5 A-E 47
11Jul94 15:26:16 15:30:28 15:34 15 A-E 48
11Jul94 17:01:29 17:05:50 17:09 19 D-W 49
11Jul94 18:37:11 18:41:11 18:44 12 D-W 50

12Jul94 13:59:03 14:02:50 14:06 9 A-E 63
12Jul94 15:33:55 15:38:08 15:41 18 A-E 64
12Jul94 17:09:14 17:13:31 17:17 17 D-W 65
12Jul94 18:45:15 18:48:47 18:51 7 D-W 66

13Jul94 14:06:20 14:10:20 14:13 14 A-E 79
13Jul94 15:41:26 15:45:41 15:49 19 D-W 80
13Jul94 17:16:57 17:21:03 17:24 13 D-W 81

14Jul94 12:38:54 12:42:28 12:45 8 A-E 94
14Jul94 14:13:35 14:17:44 14:21 17 A-E 95
14Jul94 15:48:55 15:53:07 15:56 18 D-W 96

14Jul94 17:24:42 17:28:25 17:31 9 D-W 97

Los Angeles, CA
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 15:24:01 15:27:55 15:31 12 A-E 48
11Jul94 16:58:51 17:03:18 17:07 23 A-E 49
11Jul94 18:34:21 18:38:44 18:42 20 D-W 50
11Jul94 20:10:23 20:14:02 20:17 8 D-W 51

12Jul94 13:57:04 14:00:19 14:03 6 A-E 63
12Jul94 15:31:24 15:35:34 15:39 17 A-E 64
12Jul94 17:06:33 17:11:00 17:14 24 D-W 65
12Jul94 18:42:13 18:46:24 18:50 15 D-W 66

13Jul94 14:03:56 14:07:48 14:11 10 A-E 79
13Jul94 15:38:50 15:43:08 15:46 21 A-E 80
13Jul94 17:14:16 17:18:34 17:22 21 D-W 81
13Jul94 18:50:05 18:53:55 18:57 10 D-W 82

14Jul94 14:11:07 14:15:11 14:18 15 A-E 95
14Jul94 15:46:15 15:50:35 15:54 24 D-E 96
14Jul94 17:21:51 17:26:00 17:29 17 D-W 97
14Jul94 18:58:06 19:01:16 19:03 5 D-W 98

Honolulu, HI
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 15:14:29 15:17:59 15:21 7 A-E 48
11Jul94 16:48:57 16:53:29 16:57 52 A-E 49
11Jul94 18:24:51 18:29:17 18:33 27 A-W 50
11Jul94 20:01:06 20:05:24 20:09 17 D-W 51
11Jul94 21:37:01 21:41:32 21:45 25 D-E 52
11Jul94 23:12:42 23:17:24 23:21 67 D-W 53

12Jul94 00:49:05 00:52:48 00:56 9 D-W 54
12Jul94 15:21:26 15:25:41 15:29 16 A-E 64
12Jul94 16:56:44 17:01:18 17:05 64 A-W 65
12Jul94 18:32:57 18:37:15 18:41 20 A-W 66
12Jul94 20:09:05 20:13:25 20:17 18 D-E 67
12Jul94 21:44:49 21:49:28 21:53 41 D-E 68
12Jul94 23:20:40 23:25:09 23:29 27 D-W 69

13Jul94 13:54:48 13:57:51 14:00 5 A-E 79
13Jul94 15:28:50 15:33:18 15:37 37 A-E 80
13Jul94 17:04:35 17:09:03 17:13 32 A-W 81
13Jul94 18:40:56 18:45:08 18:48 17 D-W 82
13Jul94 20:16:50 20:21:17 20:25 22 D-E 83
13Jul94 21:52:30 21:57:12 22:01 88 D-E 84
13Jul94 23:28:45 23:32:44 23:36 12 D-W 85

14Jul94 14:01:16 14:05:17 14:08 12 A-E 95
14Jul94 15:36:18 15:40:51 15:44 86 A-W 96
14Jul94 17:12:26 17:16:45 17:20 22 A-W 97
14Jul94 18:48:42 18:52:54 18:56 17 D-E 98
14Jul94 20:24:24 20:28:59 20:33 33 D-E 99
14Jul94 22:00:10 22:04:44 22:08 36 D-W 100

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-65.007
STS-65 World R/S Times 07/11

Below are the rise and set times for STS-65 for selected worldwide cities
over the next four days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

London, England
STS-65 Element Set JSC-06

no visible passes

Paris, France
STS-65 Element Set JSC-06

no visible passes

Tokyo, Japan
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 22:58:28 23:02:37 23:06 14 A-E 53

12Jul94 00:33:35 00:37:52 00:41 17 D-W 54
12Jul94 02:09:19 02:13:10 02:16 10 D-W 55
12Jul94 21:31:15 21:35:00 21:38 9 A-E 68
12Jul94 23:06:07 23:10:17 23:13 17 A-E 69

13Jul94 00:41:13 00:45:24 00:49 15 D-W 70
13Jul94 02:17:20 02:20:38 02:23 6 D-W 71
13Jul94 21:38:32 21:42:29 21:45 13 A-E 84
13Jul94 23:13:38 23:17:49 23:21 18 D-W 85

14Jul94 00:48:50 00:52:47 00:56 11 D-W 86
14Jul94 20:11:05 20:14:38 20:17 8 A-E 99
14Jul94 21:45:46 21:49:53 21:53 16 A-E 100
14Jul94 23:21:07 23:25:14 23:28 16 D-W 101

Sydney, Australia
STS-65 Element Set JSC-06

date rise tca set el geo orbit

11Jul94 13:20:10 13:24:21 13:28 16 A-W 46
11Jul94 14:56:37 14:59:36 15:02 5 A-W 47

12Jul94 08:42:03 08:45:51 08:49 10 D-E 59
12Jul94 10:16:50 10:21:12 10:25 22 D-E 60
12Jul94 11:52:16 11:56:39 12:00 22 A-W 61
12Jul94 13:28:07 13:32:00 13:35 11 A-W 62

13Jul94 08:49:13 08:53:22 08:57 15 D-E 75
13Jul94 10:24:21 10:28:47 10:32 24 A-E 76
13Jul94 11:59:57 12:04:13 12:07 18 A-W 77
13Jul94 13:36:12 13:39:29 13:42 6 A-W 78

14Jul94 07:21:53 07:25:29 07:28 8 D-E 90
14Jul94 08:56:28 09:00:48 09:04 20 D-E 91
14Jul94 10:31:50 10:36:14 10:40 24 A-W 92
14Jul94 12:07:37 12:11:37 12:15 13 A-W 93

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

1016. DOVE Telemetry Decoding Software

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 14:34:23 UTC
From: jcw@kd4dts.atl.ga.us
Message-ID: <1994Jul11.143423.1710@kd4dts.atl.ga.us>
Source record: 27325

I'm looking for some good software for decoding the telemetry
from DOVE. I'd like something that I can both connect to a
TNC, and feed it a file from a terminal program running in
capture mode. I've got the one that was posted to ftp.funet.fi
(DOVE3W13) but I'm not overly impressed.

If anyone has any suggestions for something better, or a program
that can handle the telemetry from other satellites, I'd like
to know about it, please.

- John
--

John C. Wren (kd4dts) | "The UNIX operating system has a command, NICE,
jcw@kd4dts.atl.ga.us | which allows a user to voluntarily reduce the
..!emory!wa4mei!kd4dts!jcw | priority of his process, in order to be nice to

1017. Internet Offers Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 18:43:40 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <2vs3ss$a0k@news.CCIT.Arizona.EDU>
Source record: 27320

Dear Colleague:

Student Space Action would like to inform you of a way in which you can directly voice your support for manned space exploration. As you read this, your space program is in danger of becoming extinct. Congress is once again attempting to eliminate space station funding. Cancellation of the space station could mean the phase-out of space exploration and eventual termination of aerospace industries and job opportunities. The resulting impact on the nation's economy, technology and educational system would be disastrous.

You can tell your congressmen exactly how much you support the space station and the manned space initiative by signing the Student Space Action's Interactive Online Petition. Simply follow these steps:

telnet seds.lpl.arizona.edu
login> space

Now answer the questions to the best of your ability
(read the directions accompanying the petition--
use <tab> to enter answer; <enter> to toggle yes/no;
up/down arrows to go backwards and forwards through
questions. Caution: if floating characters appear on
your screen--ignore--it's probably just an emulation
problem. Your petition will still be signed.

After you submit the petition, you will receive information
on your congressmen and senators so you can contact them further
by phone or mail if you desire.

The petition is also accessible by NCSA Mosaic. Simply go to the following
URL and follow the directions:

URL: http://seds.lpl.arizona.edu/ssa/petition.html

Answer the questions and submit the petition and you
will receive the same information as the telnet version.
You will also have the option of linking to the space
station home page where you can read up-to-date information
on the space station, including issues of "Space Station
This Week."

Please forward this message to anyone you may feel would want to be a part
of this effort--everyone!

If you believe the space program is a vital part of our country's future,
both in economic growth and technological advancement, then sign the

Student Space Action's Interactive Petition.

If you believe that NASA should remain as an engine for continued manned space exploration, then tell everyone you know to sign this petition.

If you believe that our government, by supporting an initiative like the space station, is making an investment in the future generation of this great nation, then send your message to Washington by signing the Student Space Action Interactive Petition.

SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

Your voice does count! And it WILL make a difference!

Sincerely,

--
Student Space Action
"Don't Take Away Our Frontier!"
For general responses: ssa@seds.lpl.arizona.edu
For technical or policy inquiries: chrisl@bozo.lpl.arizona.edu
or gamageb@db.erau.edu
We will keep reaching for the stars....

1018. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 20:29:03 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.773958543@afit.af.mil>
Source record: 27326

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94192.25000000 .00002043 00000-0 47692-5 0 121
2 23173 28.4710 348.6130 0002783 331.8577 348.2890 15.90370106 409
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1019. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 20:29:20 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.773958560@afit.af.mil>
Source record: 27319
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94192.25000000 .00002043 00000-0 47692-5 0 121
2 23173 28.4710 348.6130 0002783 331.8577 348.2890 15.90370106 409
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1020. Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 21:00:14 UTC
From: randyh@gvgadg.gvg.tek.com
Message-ID: <2vsbsu$9ve@gv-gate.gvg.tek.com>
Source record: 27321

I have been thinking about what it would take to put together a portable 9600 baud satellite station? After all, the satellite is a cube about 9" on a side, can we put together something about that size?

My idea is to have a radio, tnc, antenna, and laptop computer that could be powered from a battery and used anywhere. I thought I would pose a few questions to the net to gather up some suggestions from those with 9600 baud pacsat experience. I don't know if I will really put this together, but it is interesting to think about. I am posting this to both bbs@amsat.org and rec.radio.amateur.space groups.

RADIO:
First thought is to use one of the newer dual banders that come ready for 9600 packet. These have the new jack on the back that connects the TNC to the proper stages within the radio to support 9600 baud. One of the problems that I see with these radios is the IF bandwidth to allow for Doppler shift of +/- apx 10KHz. Most of these radios tune in 5KHz steps. So do we have a problem with tuning needed to track Doppler with this style of radio? Also, the cost of these radios is rather high.

Another idea is to use an older 25 watt 2 meter radio for the uplink. This radio would need to be modified to drive the vco from the TNC. These are pretty cheap. For the downlink, could a simple scanner work? Bruce, N4USH, posted a message about using a Radio Shack Pro 2006 scanner to receive downlinks. I have modified a scanner for APT fax use by changing out the IF filter with a filter of wider bandwidth. Bruce used the search mode of the scanner to change to a new frequency to follow the sat's Doppler change. The system would also probably require a preamp to help out the receiver. Comments on using this setup for the radios?

TNC:
There seems to be many 9600 baud G3RUH compatible TNCs on the market. I have seen the ads for AEA, DRSI, and others. The DRSI looks interesting as it draws only 40mA. Also, using a TNC that supports normal 1200 baud allows connection to common PBBS and users. Are any of these TNCs better or easier to use than others?

ANTENNA:
Couple of ideas here. A couple of quarter wave ground planes could be used. I see that several of the antenna manufacturers sell 144/440 4/5 element beams using a common boom. MFJ sells one for around $40. One of these could be mounted to a camera tripod and hand tracked during the pass. The beamwidth of these short beams is wide, which helps to simplify tracking of the satellite. The antenna needs to be easy to assemble and disassemble to allow for easy transport.

COMPUTER:
A portable of probably at least 386SX power with hard disk would be needed to run PB, PG and a tracking program. What is the minimum computer needed? The tracking program could generate an AZ/EL list before the pass and either print a list (if printer available) or the user could write these numbers down. Then during to pass the operator hand tracks the satellite and lets PB or PG run. Being more of a Mac person, can PB & PG run under Soft PC on a Mac portable?

BATTERY:
A gel cell could be used to power everything. Probably something in the 12 AH range would be needed. A solar panel could be used to charge the battery between passes. A power cord to connect the system into a carUs cigarette lighter would also be useful.

So, it seems that it is possible to build a portable 9600 baud satellite station that would fit inside a camera bag or brief case. Has anyone put together such a package? Any other comments about this portable idea?

I'll compile a list of all the responses that I receive. If there is interest I'll post the responses.

Thanks,

Randy
WA2AGE

wa2age@amsat.org
randyh@gvgadg.gvg.tek.com

1021. ARLS026 NASA operations detailed

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 22:16:58 UTC
From: w1aw@arrl.org
Message-ID: <$arls026.1994@ampr.org>
Source record: 27323
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS026
ARLS026 NASA operations detailed

ZCZC AS70
QST de W1AW
Space Bulletin 026 ARLS026
From ARRL Headquarters
Newington, CT July 11, 1994
To all radio amateurs

SB SPACE ARL ARLS026
ARLS026 NASA operations detailed

NASA operations detailed

At least 12 amateur stations associated with the National Aeronautics and Space Administration will be active July 19 to 22 to commemorate the 25th anniversary of humans landing on the moon, on July 20, 1969, on Apollo 11. The operations will begin at 0700 UTC July 19 and end at 0500 UTC July 22, coinciding with the time the Apollo Moon Lander (the Eagle) was on the moon's surface in 1969.

Stations are expected to be on modes including CW, SSB, FM, packet, Pactor, Amtor, RTTY, SSTV, ATV, and amateur satellites. Here are the 12 stations expected to be active:

Ames Amateur Radio Club, NASA Ames Research Center, Moffett Field, California: K6MF (AARC, Box 73, Moffett Field CA 94035-1000).

Dryden Amateur Radio Club, NASA Dryden Flight Research Center, Edwards, California: KF7GD (NASA DFRC, Attn: Dryden ARC, POB 273, Edwards CA 93523).

Goddard Amateur Radio Club, NASA Goddard Space Flight Center, Greenbelt MD: WA3NAN (GARC, PO Box 86, Greenbelt, MD 20768-0086).

Guam Contingency Landing Site Amateur Radio Group: KC4YDP/KH2 (NASA RADIO, Kennedy Space Center FL 32899).

NASA Headquarters Amateur Radio Group, Washington, DC: N4ZR (2003 Sarazen Place, Reston VA 22091-3809).

Jet Propulsion Laboratory Amateur Radio Club and Goldstone Amateur Radio Club, Jet Propulsion Laboratory, Pasadena, California: W6VIO (JPLARC, M/S 168-327, 4800 Oak Grove Dr, Pasadena, CA 91109).

Johnson Space Center Amateur Radio Club, NASA Johnson Space Center, Houston, TX: W5RRR (JSC ARC/W5RRR, Johnson Space Center, Houston TX 77058).

Kennedy Space Center Amateur Radio Group, Kennedy Space Center, Florida: KC4TCV (NASA RADIO, Kennedy Space Center FL 32899).

NASA Lewis Amateur Radio Club (NLARC), NASA Lewis Research Center, Cleveland, Ohio: AK8Y (NASA Lewis Amateur Radio Club, 21000 Brookpark Rd, MS 54-6, Cleveland OH 44135).

Marshall Amateur Radio Club, NASA Marshall Space Flight Center, Huntsville, Alabama: WA4NZD (Marshall Amateur Radio Club, CM21X, MSFC AL 35812).

Stennis Space Center Amateur Radio Club, NASA Stennis Space Center, Mississippi: K5GY (Stennis Space Center Amateur Radio Club, Bldg 1201, Stennis Space Center MS 39529).

Wallops Island Amateur Radio Club, NASA Wallops Flight Facility, Wallops Island, Virginia: KE3ND (Wallops Island ARC, NASA Wallops Flight Facility, Building E-134, Wallops Island VA 23337).

White Sands Complex Amateur Radio Group, NASA White Sands Test Facility, Las Cruces, New Mexico: KF7E (P.O. Box 627, Organ NM 88052).
NNNN
/EX

1022. Re: Satellites seen fron Earth

Newsgroup: rec.radio.amateur.space
Date: 1994-07-11 23:14:14 UTC
From: lstuart@ltpsun.gsfc.nasa.gov
Message-ID: <lstuart-110794191415@lstuart.gsfc.nasa.gov>
Source record: 27322

There are numerous sets of two-line elements available through FTP; also freeware and shareware for computing viewing times and look angles. Suggest you surf through some of Ted Kelso's articles posted here, and to sci.space.news, sci.space.astro, and sci.space.science.

In article <stjacque.58.0@nbnet.nb.ca>, stjacque@nbnet.nb.ca (Ecole St-Jacques) wrote:

> Hi,
> I am an amateur astronomer and often wondered if it was possible to identify
> the satellites crossing the night sky. If anyone knows, I guess you guys
> should know.
> So, would anyone be so kind and send me the coordinates, dates, times...
> I am at long.68*26, lat.+47*28.
> I will appreciate very much.
> Thanks.
> Rachel

1023. STS-65 Orbital State Vector Rev #51

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 00:24:11 UTC
From: astroman@netcom.com
Message-ID: <astromanCssx4B.D0K@netcom.com>
Source record: 27324
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 1017
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94192.85132475694
07/11/1994 20:25:54.458 UTC
ECI X: -19792893.699414 ft
M50 Y: 9217659.589786 ft
Z: 1839134.071865 ft
Xdot: -10369.12109 ft/s
Ydot: -19862.16016 ft/s
Zdot: -11877.81641 ft/s
ndot/2 (drag): 0.00082398099 rev/day^2
nddt/6: 2.84871E-08 rev/day^3
Bstar: 2.54622E-04 1/Earth Radii
Elset #: 11
Rev @ Epoch: 51.47311622552

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1024. Sattelite Descriptions-Info.Misc

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 04:56:17 UTC
From: d
Message-ID: <d-110794214838@17.255.28.12>
Source record: 27327

Since I'm kind of new to the sattelite tracking world I am trying to find out more about the sattelites which are listed in the two line Nasa data and Amsat 2L data. I can load these up and do all of the niffty things that Orbitrack does but most the time I haven't a clue as to what the sattelite does or who it belongs to. Does anyone know about any publications, listings out there that can shed some light on this subject?

1025. Re: GARC Shuttle Communications Retransmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 06:33:00 UTC
From: barkman@zeta.is.tcu.edu
Message-ID: <1994Jul12.014329.248@news.tcu.edu>
Source record: 27328
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <2vr9gv$eo8@paperboy.gsfc.nasa.gov>, Erich Franz Stocker
<stocker@spsosun.gsfc.nasa.gov> writes...
>
>INTERESTED IN STS-65 SHUTTLE TRANSMISSIONS
>The Goddard Amateur Radio Club (GARC) invites interested people to tune
>in to
>STS-65 shuttle ground communications transmissions. As a public service
>to the
>Amateur radio community, the GARC retransmits space shuttle air-to-ground
>communications. During the STS-65 mission which also carries a Shuttle

[some deleted]

I felt I just had to say this. I'm listening right now to 3860 kHz and I
hear more jabber from the guy at the radio club than the retransmissions
from the shuttle. I've noticed this trend over past shuttle missions as well
that the radio club talks an awful lot. Some of the information is quite
useful but at the expense of the primary purpose for the station.
I don't know how you could solve this problem unless you used another freq for
your bulletins, maybe up 10 kHz, and announced that on the retransmission
freq before you speak, or have a regular schedule for these transmission
on the alternate freq. I hope you don't think I'm griping too much because I
can't thank the people there enough for this service. When our link here isn't
working or I go on a trip, you are always there.

Just my $0.02.

myles KG5AI

1026. STS-65 Orbital State Vector Rev #61

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 14:41:02 UTC
From: astroman@netcom.com
Message-ID: <astromanCsu0sE.Bnq@netcom.com>
Source record: 27329
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94193.50219915509
07/12/1994 12:03:10.007 UTC
EFG E: -20131194.22 ft
F: 1177497.36 ft
G: -8568484.44 ft
Edot: -4248.2829 ft/s
Fdot: -22539.5027 ft/s
Gdot: 6908.7131 ft/s
ndot/2 (drag): 0.00077029322 rev/day^2
nddt/6: 2.48957E-08 rev/day^3
Bstar: 2.37983E-04 1/Earth Radii
Elset #: 12
Rev @ Epoch: 61.84693482098

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1027. STS-65 Element Set (94193.260)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 15:01:07 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94193.260@alsys.com>
Source record: 27330
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94193.26085228 +.00002036 00000-0 47272-5 0 146
2 23173 28.4704 341.0586 0002767 343.5572 16.4949 15.90437602 584

Satellite: STS-65
Catalog number: 23173
Epoch time: 94193.26085228 (12 JUL 94 06:15:37.64 UTC)
Element set: GSFC-014
Inclination: 28.4704 deg
RA of node: 341.0586 deg Space Shuttle Flight STS-65
Eccentricity: 0.0002767 Keplerian Elements
Arg of perigee: 343.5572 deg
Mean anomaly: 16.4949 deg
Mean motion: 15.90437602 rev/day Semi-major Axis: 6679.1896 Km
Decay rate: 0.20E-04 rev/day*2 Apogee Alt: 302.65 Km
Epoch rev: 58 Perigee Alt: 298.95 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1028. Re: KLM vs. M2 antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 15:31:07 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jul12.153107.273@ke4zv.atl.ga.us>
Source record: 27333

In article <9407051841.ZM29483@SALCIUS2> Wayne_Estes@csg.mot.COM (Wayne_Estes) writes:
>I am about to put up Oscar antennas on my roof. I have tentatively ruled out
>the KLM 22C antenna because the boom is so long. I would prefer to use either
>the small KLM's, or the M2 antennas which are 16 elements on VHF, 30 elements
>on UHF.

The big KLMs are so much better than anything else that I'd make every
effort to fit them on the roof rather than accept a smaller compromise.
They *can* be made to work on a chimney mount.

>I would appreciate anybody's comments:
>
>1. Comparison of small KLM (14 el. on VHF) vs. M2 antennas (16 el. on VHF) ?
> (gain, mechanical construction, weather problems, polarity relays, etc.)
>2. Is a closet rod an acceptable substitute for a fiberglass crossboom ?
> If so, is polyurethane an acceptable sealant ?

Yes, you can use a wooden crossboom, and yes poly is a good sealant.
However, the fiberglass crossboom will be better over the long term.
Again, don't stint on your antennas for satellite.

>3. Best weatherproof VHF preamp that can handle 50+ watts ?

SSB Electronics.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

1029. Re: oscar rigs, etc.

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 15:45:46 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jul12.154546.504@ke4zv.atl.ga.us>
Source record: 27334

In article <2vi09l$cda@netline-fddi.jpl.nasa.gov> rspear@sookit.jpl.nasa.gov writes:
>Content-Transfer-Encoding: 7bit
>X-Newsreader: TIN [version 1.2 PL0]
>
>
>i'm trying to put together a first sat station ... right now i just use a
>2 meter mobile rig, power supply and 3 element beam. i know about 726's
>and 736's, but i would like to enter the hobby at a less expensive level.
>seems that there are 2 meter and 430 mhz multimodes that were used for sat
>comm before the fancy newer rigs ... anyone have suggestions for entry
>level stuff?

Yes, any of the Icom Twin sets are fine. The IC211 and IC251 need the
Mutek front end board fitted for best results. Since Mutek doesn't make
those anymore, that could be a tough problem. I've got a IC211 with the
Mutek board that blew the doors off most of the more modern rigs before
lightning got it. Even without the Mutek board, a strong preamp can
bring these radios alive. If you have a HF rig, take the IF out signal
from the back and run it into the HF rig. Then you can use the narrow
filters in the HF rig. Note, that uses the 2m rig as a tunable transverter.

Another alternative is to actually *use* a transverter. The Microwave
Modules units are functional, but hard to find since they went out
of production. The SSB Electronics transverters are wonderful, but
you'll pay as much for one of those as for a modern multimode. If you
are adventuresome, you might try to find the IC202 and IC402 portable
SSB rigs. They are VXO controlled, and use a considerably older technology,
but they do work.

For the cheapest of the cheap, if you have a HF receiver, you can use
a Hamtronics converter in front of it for 2m receive, and use a surplus
commercial FM transmitter strip as a CW transmitter on 435 MHz. That's
a really cheap way to get about 100 watts of RF at 70cm.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

1030. Shuttle packet.

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 17:31:00 UTC
From: st3qi@elroy.uh.edu
Message-ID: <12JUL199412312158@elroy.uh.edu>
Source record: 27331

Could someone repost or send me a copy (st3qi@jetson.uh.edu) of the
document on how to contact the shuttle via packet? The freqs, etc.
I saw it on packet a while back, but it's already been deleted from the
message base. Thanks a million es 73.

Brad A. Killebrew N5LJV | Student of Computer Engr Technology
President, University of Houston ARC | University of Houston, Texas
Internet: st3qi@jetson.uh.edu | U of H Amateur Radio Club WB5FND
Internet: n5ljv@sugarland.ampr.org | uharc@post-office.uh.edu
Paket : n5ljv@f6cnb.#setx.tx.usa.na | 713-743-4070 Fax 713-743-4032
AT&Tnet : 713-852-8523 Fax 852-2630 | Box 85-T2, 4800 Calhoun, 77204-4083
"Life is like a box of chocolates, if you can't stand the heat, for liberty
and justice for all, hallow be thy name, go ahead make my day" - I.M. Wright

1031. Re: GARC Shuttle Communications Retransmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 18:32:28 UTC
From: daveb@magneton.physics.Arizona.EDU
Message-ID: <1994Jul12.183228.9778@galileo.physics.arizona.edu>
Source record: 27336
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <1994Jul12.014329.248@news.tcu.edu>,
Myles Barkman - KG5AI <barkman@zeta.is.tcu.edu> wrote:
>In article <2vr9gv$eo8@paperboy.gsfc.nasa.gov>, Erich Franz Stocker
<stocker@spsosun.gsfc.nasa.gov> writes...
>
>I felt I just had to say this. I'm listening right now to 3860 kHz and I
>hear more jabber from the guy at the radio club than the retransmissions
>from the shuttle. I've noticed this trend over past shuttle missions as well
>that the radio club talks an awful lot. Some of the information is quite
>useful but at the expense of the primary purpose for the station.
>I don't know how you could solve this problem unless you used another freq for
>your bulletins, maybe up 10 kHz, and announced that on the retransmission
>freq before you speak, or have a regular schedule for these transmission
>on the alternate freq. I hope you don't think I'm griping too much because I
>can't thank the people there enough for this service. When our link here isn't
>working or I go on a trip, you are always there.
>
>Just my $0.02.
>
>myles KG5AI
>

Myles,

During shuttle missions such as this one, there is a large amount of the
"retransmission" time in which no earth-to-ground transmissions are taking
place. As in the previous missions in which a mid-deck and payload bay
module were being used and very few problems were being encountered, when
there is no transmission, the GSFC retransmission frequencies are quiet
and subject to someone else moving in on the frequency (try listening
on 14.295 or 7185 some time). The poeple working at WA3NAN do a great job
of bringing us the missions, and almost always are aware of when there
is someone talking either to the shuttle or the ground. In this case, I
have heard the GSFC group stop transmitting (even in the midst of reading
an element set) until the shuttle transmission was finished.

Unfortunately, not all hams are aware (and some ARE, but don't care), of
the shuttle retransmissions, and frequently transmit close enough to QRM
WA3NAN. It seems to make sense to me that, during quiet times from the
shuttle, the folks at Goddard transmit in order to let others know that
the frequency is occupied. Again, during a mission such as this, those
quiet times are many. Perhaps we might suggest some things that we are
interested in knowing about during shuttle missions that WA3NAN could
transmit during these quiet times. I'm sure they would like to give us

information other than crew biographies over and over. Maybe they could
give background on what type of science is being done on a particular mission.

Just another perspective,

Dave

--
Dave Burnett | daveb@magneton.physics.arizona.edu
Department of Physics | -or- wd8krv@amsat.org
University of Arizona |
Tucson, AZ 85721 | "We do bubbles best..."

1032. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 23:34:10 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774056050@afit.af.mil>
Source record: 27332

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94193.25000000 .00002036 00000-0 47272-5 0 151
2 23173 28.4704 341.1397 0002768 343.4250 314.3595 15.90437558 563
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1033. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-12 23:34:28 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774056068@afit.af.mil>
Source record: 27202
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94193.25000000 .00002036 00000-0 47272-5 0 151
2 23173 28.4704 341.1397 0002768 343.4250 314.3595 15.90437558 563
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1034. STS-65 Orbital State Vector Rev #65

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 02:53:39 UTC
From: astroman@netcom.com
Message-ID: <astromanCsuypG.M2H@netcom.com>
Source record: 27335
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94193.75243540509
07/12/1994 18:03:30.419 UTC
EFG E: 3437684.35 ft
F: 19689416.44 ft
G: -8979370.44 ft
Edot: -22160.2418 ft/s
Fdot: 6671.3730 ft/s
Gdot: 6170.2319 ft/s
ndot/2 (drag): 0.00077342045 rev/day^2
nddt/6: 2.50970E-08 rev/day^3
Bstar: 2.37972E-04 1/Earth Radii
Elset #: 13
Rev @ Epoch: 65.83537638695

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1035. Re: Sattelite Descriptions-Info.Misc

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 05:39:04 UTC
From: erwinn@ecs.comm.mot.com
Message-ID: <1994Jul13.053904.908@lmpsbbs.comm.mot.com>
Source record: 27340

This is a copy of an article "6500hage@ucsbuxa.ucsb.edu (William F. Hagen)" wrote "20 Apr 92 06:54:52 GMT", hope this will help you ...

5 VANGUARD 1: The second USA satellite (after Explorer 1) and the oldest satellite still in orbit from any nation. Vanguard 1 is very faint visually, between tenth and fifteenth magnitude depending on its distance and illuminaton.

16 VANGUARD 1 ROCKET/BODY: The oldest RB in orbit, and with the Vanguard 1 payload, the oldest object still in orbit from any nation. The Vanguard RB is much brighter than its payload, sometimes as bright as seventh magnitude on very favorable passes.

20 VANGUARD 3: This satellite was never separated from its rocket/body, so it is unusually bright for the early payloads still in orbit. At perigee it can reach sixth magnitude, although it spends most of its time at much higher altitudes.

47 TRANSIT 2-A ROCKET/BODY: From the 1960 launch of an early Transit navigation satellite.

59 COURIER 1-B ROCKET/BODY: This is the rocket/body from the launch of the very early low-orbit Courier 1-B communications satellite. Launched in October 1960, three years to the day after Sputnik 1, there are only 22 objects (counting payloads, R/Bs and debris) that have been in orbit longer than NORAD catalog number 59. And at a reliable sixth magnitude this satellite is an easy object to spot in binoculars.

424 ALOUETTE 1: An eigth magnitude Canadian satellite that investigated the ionosphere. This is the oldest non-USA satellite in Earth orbit, older than any Soviet satellite in Earth orbit. There are two older Soviet spacecraft in heliocentric orbit.

426 ALOUETTE 1 ROCKET/BODY: A fifth magnitude Agena-B rocket/body from Thor-Agena TA-1, launched in September 1962 from Vandenberg. The payload was Alouette 1, a Canadian satellite that investigated the ionosphere.

694 CENTAUR 2: This is the first Centaur rocket ever to enter space, on the Atlas/Centaur 2 rocket launched in November 1963 from pad 36-A at the Cape Canaveral Air Force Station. A/C-1 failed due to an Atlas malfunction. Centaur 2 was an engineering test for the Centaur program, under development for the Surveyor lunar landing probes. Visually Centaur 2 is a very interesting satellite. It is tumbling with a period of 20 seconds, with a three magnitude swing from maximum to minimum. It is also in a very eccentric orbit, ranging from 500 to 1,500 kilometers, which makes Centaur 2 appear very different depending on its altitude. At perigee it ranges from first to fourth magnitude every 20 seconds, and at apogee the swing is between fourth

and seventh magnitude. Centaur 2 is the most easily seen satellite launched before the mid-60s. This is one of the three Centaurs in low orbit.

727 SOLRAD 7A / SECOR 1 ROCKET/BODY: A multiple-payload fifth magnitude rocket/body, probably an Agena. The payloads were the scientific satellites Solrad 7A and Greb, the store/dump LEO comsat Secor 1, and Gravity Gradient 1.

741 ECHO 2 ROCKET/BODY: This is the Agena upper stage from the Thor-Agena TA-2 rocket that boosted the famous Echo 2 balloon satellite into a 1,000 kilometer high orbit from Vandenberg in January 1964. Echo 2 was a 135-foot diameter mylar balloon that served as a passive line-of-sight communications relay, and brilliant visual satellite, until its decay in June 1969 due to a combination of solar radiation pressure and atmospheric drag. The R/B is about sixth magnitude, still in the precise orbit that the brilliant Echo 2 once followed (the R/B has a much higher density and was unaffected by solar radiation pressure), today only and echo of Echo.

1245 SOLRAD 7B / SECOR 3 ROCKET/BODY: A multiple-payload fifth magnitude rocket/body, probably an Agena. The payloads were the scientific satellites Solrad 7B and Greb, the store/dump LEO comsat Secor 3, Gravity Gradient satellites 2 and 3, Surcal, and the amateur radio satellite Oscar 3.

1807 ALOUETTE 2 ROCKET/BODY: The Agena rocket/body from the dual launch of Alouette 2 and Explorer 31. The R/B has a wide magnitude range and a period of 40 seconds.

2142 OAO 1: Orbiting Astronomical Observatory 1 failed after two days in orbit due to a battery failure. OAO 1 has been reported as bright as magnitude -1 during one flare, although it is typically closer to fifth magnitude. All three OAOs have had flashes into the negative magnitudes, probably due to the highly reflective telescopic mirrors.

2144 OAO 1 ROCKET/BODY: Agena-B rocket/body from the launch of Orbiting Astronomical Observatory 1 in April 1966. In the fifth magnitude range.

2174 NIMBUS 2 ROCKET/BODY: Agena TA-6 rocket/body from the 1966 launch of a Nimbus polar weather satellite aboard a Thor-Agena rocket. In a sun-synchronous orbit with evening passes near sixth magnitude.

2255 PAGEOS ROCKET/BODY: Agena TA-7 rocket/body from the launch of the Pageos mylar balloon. In a 4,000 kilometer high orbit, the R/B is quite faint near ninth magnitude. It has been reported to have a flash period of 18.6 seconds.

2826 TIMATION 1 ROCKET/BODY: From launch of a navigation satellite.

3597 OAO 2: Orbiting Astronomical Observatory 2 was launched on Atlas/Centaur 16 in December 1968. OAO 2 ran a very successful ultraviolet astronomy program. All three OAOs have been reported to flash into the negative magnitudes on occasion, probably due to their highly reflective telescopic mirrors.

3598 OAO 2 ROCKET/BODY: Centaur stage from Atlas/Centaur 16, launched in December 1968 from pad 36-B at the Cape Canaveral Air Force Station. The payload was the astronomical telescope Orbiting Astronomical Observatory 2.

OAO 2 R/B is a very easily seen, if somewhat visually unpredictable, satellite. It is generally in the third magnitude range, but it is sometimes up to three magnitudes off prediction in either direction. This is one of the three Centaurs in low orbit.

4159 TIMATION 2 ROCKET/BODY: From launch of a navigation satellite.

4327 SERT 2 (Space Electric Rocket Test): This was an engineering test for ion propulsion in space. The ion engine fired a one-ounce thrust for eight months, but the engines shut down before their design lifetime and the mission was officially considered unsuccessful.

4392 MAO 1 ROCKET/BODY: The RB from the first Chinese launch, of the 'East is Red' satellite, in April 1970.

4786 COSMOS 382: This is by far the largest piece from the Cosmos 382 satellite, which apparently made some separations during its operational lifetime. C-382 was an engineering test for the 1971 Soviet missions to Mars, which included the first soft landing ever made on that planet. Unfortunately the 1971 spacecraft fleet arrived during a major dust storm that obscured the planet's surface from view and made conditions on the surface inhospitable to the Soviet lander, which went silent seconds after touchdown. C-382 is a rather large satellite in a fairly high orbit, making it relatively easy to locate visually. It has been reported to have a flash period of under five seconds.

4794 NOAA 1 ROCKET/BODY: Delta rocket/body from the launch of the NOAA 1 polar weather satellite in December 1970 from Vandenberg. Sun-synchronous orbit, flash period reported of 3.5 seconds.

4966 COSMOS 398: This satellite, close to re-entry, is thought to have been an engineering test related to the Soviet manned lunar landing program.

5994 PAGEOS DA: This is one of the two large pieces of the Pageos balloon satellite still in orbit. Pageos is a 100-foot diameter mylar ballon, nearly identical to the Echo satellites, launched into a very high polar orbit from Vandenberg. Pageos' orbital altitude was initially near 4,000 kilometers, but the satellite was still second magnitude despite the very great distance. This combination of great altitude and great size made Pageos one of the most interesting visual satellites ever launched. Due to its great surface area and low mass, Pageos was subjected to intense solar sailing due to the radiation pressure of sunlight. In 1975 Pageos broke up in orbit, possibly due to weakening from micrometeoroid impacts, into about 75 pieces. Only five remain in orbit, and only two of these are large pieces (5994 and 8074). These two satellites are still active solar sailers. Solar radiation pressure has, over time, made the orbits of 5994 and 8074 very elliptical. Their perigees are under 1,000 kilometers, and their apogees are nearly 7,000 kilometers. Since they have very low densities, their perigee altitudes are dangerously low and they will probably re-enter within the next few years. This is the same fate that brought down the similar Echo balloons -- solar sailing down the perigee, and atmospheric drag finishing the job. Both 5994 and 8074 are quite bright and easily seen objects, normally seen in

intermediate altitudes near fourth to sixth magnitude. Due to their large surface area and irregular shape their brightness can be unpredictable. 5994 was mistakenly catalogued by NORAD as one of the Westford Needles deployed from the Midas 6 satellite, which were in a similar orbit to Pageos, but it is clearly a Pageos fragment.

6126 LANDSAT 1: USA earth resources satellite. For information on the Landsat program, see 14780.

6153 COPERNICUS (OAO 3): The third Orbiting Astronomical Observatory, renamed Copernicus in orbit, was launched on Atlas/Centaur 22 in August 1972 from pad 36-B. It ran a very successful ultraviolet and X-ray astronomy program. Visually Copernicus is one of the most interesting satellites in orbit. It has a complex light curve that repeats every minute. It will be very faint, in the seventh magnitude range, and slowly increase brightness over almost a minute to third magnitude. Then it will rapidly increase brightness and flash in the magnitude zero to -2 range. The magnitude drop after the flash is very rapid as it sinks back to seventh magnitude. All three OAOs have flashed into the negative magnitudes, although Copernicus is the only one to do so regularly. These flashes are probably caused by their very reflective telescopic mirrors. Despite its brilliant flashes Copernicus can be a difficult satellite to observe because it is nearly invisible at minimum.

6155 COPERNICUS (OAO 3) ROCKET/BODY: Centaur stage from Atlas/Centaur 22, launched in August 1972 from pad 36-B at the Cape Canaveral Air Force Station. Copernicus R/B is fairly easily seen, typically near third magnitude, but its brightness is somewhat unpredictable like 3598. This is one of the three Centaurs in low orbit.

7228 MIRANDA ROCKET/BODY: The Scout solid-fuel upper stage from the launch of the British experimental satellite Miranda. In the seventh to eigth magnitude range.

7615 LANDSAT 2: USA earth resources satellite. For information on the Landsat program see 14780.

7902 INTELSAT 4-1 ROCKET/BODY: Information on the Intelsat-4 rocket/body series is very similar to the Intelsat 4-A rocket/body series; see 8331.

7646 STARLETTE: French geodetic satellite, 25 centimeters diameter, passive laser reflector. Probably not a good candidate for visual observation.

7946 NIMBUS 6 ROCKET/BODY: Delta upper stage from the 1975 launch of a Nimbus weather satellite. In a sun-synchronous orbit with evening passes near fifth magnitude.

8074 PAGEOS H: Large fragment of the Pageos balloon. See 5994 for details.

8331 INTELSAT 4A-1 ROCKET/BODY: Centaur stage from the launch of an Intelsat 4A international communications satellite. The Centaur stages in Geosynchronous Transfer Orbit (GTO) have bright repeating glints that can be seen in binoculars at fairly high altitudes. The perigee altitudes of the five Intelsat 4A, seven Intelsat 4 and four Comstar rocket/bodies are high

enough to avoid significant atmospheric drag; the three Intelsat 5 and the FltSatCom 4 rocket/bodies have a very low perigee that makes their positions somewhat uncertain. These GTO Centaur objects have a very unique appearance, due to their size, tumble and eccentric orbit, that make them interesting satellites to observe.

8709 UME 1: Japanese ionospheric sounding satellite also known as ISS-A. Flash period of 3.5 seconds.

8710 UME 1 ROCKET/BODY: Japanese N-1 rocket/body from launch of Ume-1.

8820 LAGEOS: (Laser Geodynamics Satellite) A 900-pound sphere with a diameter of 2 feet, Lageos is in a very high altitude very highly stable orbit for precise geodetic mapping. The satellite is a passive reflector for laser beams. Because of its small size and great altitude, Lageos is certainly not visible to amateur trackers.

8840 COMSTAR 1 ROCKET/BODY: Information on the Comstar rocket/body series is very similar to the Intelsat 4A rocket/body series; see 8331.

8897 COSMOS 825-832 ROCKET/BODY: Flash period of 30 seconds

9598 COSMOS 871-878 ROCKET/BODY: Soviet R/B in a 1,500 kilometer high orbit, very sharp glints every 4.17 seconds.

10293 COSMOS 939-946 ROCKET/BODY: Flash period of 31.8 seconds

10295 SIRIO ROCKET/BODY: Delta upper stage from the launch of the Italian communications satellite Sirio-1 (translation to Sirius)

10517 SAKURA ROCKET/BODY: Delta upper stage from the launch of the Japanese experimental geostationary communications satellite Sakura-1

10674 UME 2: Japanese ionospheric sounding satellite also known as ISS-B.

10675 UME 2 ROCKET/BODY: Japanese N-1 rocket/body from launch of Ume-2, flash period of 2.7 seconds.

10702 LANDSAT 3: USA earth resources satellite. For information on the Landsat series see 14780.

10793 YURI ROCKET/BODY: Delta upper stage from the launch of the Japanese experimental direct-broadcast communications satellite Yuri-1

10954 GOES 3 ROCKET/BODY: Delta upper stage from the launch of the GOES-6 geostationary civilian weather satellite.

10967 SEASAT: This polar-orbiting and slightly retrograde satellite was launched from Vandenberg to study the oceans. The solar arrays are mounted on the Agena upper stage, which was maintained as part of the Seasat structure. It came to a premature failure after a few months in orbit, partly due to errors made in the ground operation of the spacecraft. Despite its short life it produced a great deal of valuable data on the oceans and on the capabilities of synthetic aperature radar orbital mapping, a technique later used on the Magellan Venus orbiter and the Lacrosse spy satellite. Visually

Seasat is around third magnitude, although it can get as bright as zero magnitude on rare passes.

11080 NIMBUS 7: USA civilian weather satellite in sun-synchronous orbit. Passes near noon and midnight. Visually can be seen over the pole near the summer solstice.

11136 COSMOS 1051-1058 ROCKET/BODY: Flash period of 6.82 seconds

11266 COSMOS 1076: Soviet oceanographic satellite

11286 INTERCOSMOS 19 ROCKET/BODY: Soviet R/B, tumbler, with a 40 second period. Maximum can be in the second magnitude range.

11546 COSMOS 1130-1137 ROCKET/BODY: Flash period of 15.47 seconds

11671 COSMOS 1151: Soviet oceanographic satellite, flash rate of five seconds

11751 COSMOS 1171 ROCKET/BODY: Flash period of 25.8 seconds

12069 FLTSATCOM 4 ROCKET/BODY: Centaur stage from AC-57 launch of military comsat. Flash period of 5.15 seconds; the glints are fairly bright, rising a couple of magnitudes above the predicted brightness.

12497 INTELSAT 5-1 ROCKET/BODY: Centaur stage from AC-56 launch of an international communications satellite. Flash period of five seconds.

12553 NOAA 7: This polar-orbiting weather satellite is now tumbling, and has frequent glints as bright as second magnitude on favorable passes. The flash pattern is very regular and predictable. NOAA 7 is in a sun-synchronous orbit that has seasonal visibility windows. Because of the brightness of the glints it is often visible at low elevations, making it possible to see the satellite even in seasons when there are no favorable passes.

12887 SME: Solar Mesosphere Explorer science satellite studies atmosphere, sunlight and their interaction. Flash period of 2 seconds.

12889 SME ROCKET/BODY: Delta rocket/body from launch of Solar Mesospheric Explorer and amateur radio satellite Uosat Oscar-9.

12983 COSMOS 1320-1327 ROCKET/BODY: Flash period of 14.9 seconds

13007 INTELSAT 5-3 ROCKET/BODY: Centaur stage from AC-55 launch of an international communications satellite. Flash period of 4.7 seconds.

13923 NOAA 8: USA civilian weather satellite, no longer operational

13367 LANDSAT 4: USA earth resources satellite. For information on the Landsat program see 14780.

13777 IRAS (InfraRed Astronomical Satellite): IRAS, the best infrared telescope ever launched, is one of the most famous satellites in orbit. It eventually ceased operation when the liquid helium used to cool the telescope evaporated from solar warming. IRAS is a joint USA, UK and Netherlands project, and was launced on a Delta rocket from the Vandenberg Air Force Base in California. Visually IRAS is typically in the fifth magnitude range, but

it can sometimes flare up to second magnitude. It is in a sun-synchronous orbit so its visibility is seasonal. From my latitude (28 N) IRAS is best seen in the evening sky in the winter months.

13778 IRAS ROCKET/BODY: The Delta rocket/body from the launch of IRAS.

13985 SATCOM 6 ROCKET/BODY: Delta rocket/body from the launch of the Satcom-F1R communications satellite

14051 GOES 6 ROCKET/BODY: Delta upper stage from the launch of the GOES-6 geostationary civilian weather satellite

14096 EXOSAT ROCKET/BODY: Delta rocket/body from the launch of the European X-Ray Observation Satellite

14179 COSMOS 1473-1480 ROCKET/BODY: Flash period of 43.5 seconds

14372 COSMOS 1500: Soviet oceanographic satellite

14612 COSMOS 1522-1529 ROCKET/BODY: Flash period of 39.14 seconds

14693 PALAPA 4 ROCKET/BODY and 14694 WESTAR 6 ROCKET/BODY: Two PAM upper stages that were intended to boost their commercial communications satellite payloads into geostationary orbit. They were launched aboard the space shuttle Challenger and deployed into an identical parking orbit, but idential malfunctions stranded the satellites in low orbit. The payloads were recovered on a later shuttle mission and relaunched in 1990 aboard unmanned launch vehicles, but the failed PAM stages remain in low orbit, where they can be visually seen in the third to sixth magnitude range depending on altitude. This provides a unique opportunity for the observation of a PAM stage at close range.

14780 LANDSAT 5: Fifth in the USA series of earth resources satellites. Also known as ERTS (Earth Resources Technology Satellites). The Landsat series is the primary civilian USA source for global imaging of the Earth's surface. Landsat images can show the current land use and the potential natural resources. Landsats 1-3 are near sixth magnitude, and the more advanced 4 and 5 satellites are near fourth magnitude.

15202 AMPTE ROCKET/BODY: Delta upper stage from the launch of three satellites forming the Active Magnetosphere Particle Tracer Explorer constellation. The three satellites (CCE [USA], IRM [West German] and UKS [UK]) were boosted beyond the Delta's parking orbit into very highly eccentric orbits for the study of the magnetosphere. The Ampte RB ranges from fourth to eigth magnitude depending on altitude.

15244 LEASAT 2 ROCKET/BODY: Leasat 2 was launched aboard the space shuttle Discovery in August 1984 on mission STS 41-D. For generic information on the Leasat RBs, see 20411.

15331 COSMOS 1602: Soviet oceanographic satellite.

15333 COSMOS 1603: Soviet Electronic Intellegence (ELINT) satellite. Made a dramatic series of orbital manoevers after launch, changing both altitude and

orbital plane.

15354 ERBS (Earth Radiation Budget Satellite): ERBS was launched aboard the space shuttle Challenger (mission STS 41-G) in October 1984. Its mission is to study the Earth's radiation budget, i.e. the solar energy recieved and the reradiated energy from Earth. ERBS compliments similar experiments flown on several polar-orbiting NOAA weather satellites. Visually ERBS is in the fifth magnitude range.

15390 LEASAT 1 ROCKET/BODY: Leasat 1 was launched aboard the space shuttle Discovery in November 1984 on mission STS 51-A. For generic information on the Leasat RBs, see 20411.

15427 NOAA 9: USA civilian weather satellite in low polar sun-synch orbit.

15516 METEOR 2-12: Soviet weather satellite. Visually near sixth magnitude.

15595 GEOSAT: USA Geodynamic Earth and Oceans Satellite.

15625 COSMOS 1635-1642 ROCKET/BODY: Flash period of 40.25 seconds

16001 LEASAT 4 ROCKET/BODY: Leasat 4 was launched aboard the space shuttle Discovery in August 1985 on mission STS 51-I. For generic information on the Leasat RBs, see 20411.

16181 COSMOS 1697: Soviet Electronic Intellegence (ELINT) satellite.

16182 COSMOS 1697 ROCKET/BODY: Soviet SL-16 Zenit booster from launch of ELINT satellite. For generic Zenit information see 20625.

16191 METEOR 3-1: Soviet weather satellite. Visually sixth-seventh magnitude.

16229 LEASAT 3 ROCKET/BODY: Leasat 3 was launched aboard the space shuttle Discovery in April 1985 aboard mission STS 51-D. Due to a malfunction on the satellite the upper stage that became 16229 was never commanded to ignite, and the Leasat was stranded in a low orbit until a later shuttle rescue repaired the problem. A solar reflector was installed on the upper stage to try to warm the solid fuel. After several months in drift mode the booster was ignited and the Leasat entered the intended orbit. For generic information on the Leasat RBs, see 20411.

16408 METEOR 2-13: Soviet weather satellite. Visually near sixth magnitude.

16609 MIR COMPLEX: This is mankind's only operational space station. The Soviet complex consists of the Mir core, two Kvant modules, and one Kristall module, all launched separately and docked in orbit. Cosmonauts are launched to the Mir complex and return to Earth aboard Soyuz spacecraft. When manned the Mir includes the crew's Soyuz craft. The normal Mir crew size is two, although it is typically five for a short time when the old crew hands over to the new crew. There are frequent launches of unmanned Progress cargo supply spacecraft to Mir when manned, and there is normally one Progress docked to the complex. The primary purposes of the Mir are life-sciences experiments to determine the effect of long-duration weightless conditions on the human body

and 'microgravity' commercial industrial experiments. Visually Mir is in the zero magnitude range and is easily the brightest artificial satellite in orbit. Because of frequent manoevering to compensate for atmospheric drag, and occasional major orbital changes during rendezvous with Soyuz and Progress spacecraft, Mir will often be much earlier or later than predicted by satellite tracking software.

16728 COSMOS 1745 ROCKET/BODY: Flash period of 11.02 seconds

16908 EGP/AJISAI: This Japanese satellite is the most distinctive object in orbit. EGP (Experimental Geodetic Payload), also known as EGS (Experimental Geodetic Satellite) or Ajisai (Hydrangea flower), was launched on the first test flight of the H-1 rocket in August 1986. EGP is a sphere with a diameter of seven feet, and is covered with mirrors and corner-cube reflectors. The latter are used to reflect laser beams and are invisible to amateur observers, but the mirrors are spectacular. They are designed to reflect sunlight so the satellite can be photographed by ground stations for precise geodetic surveying measurements. The glints are probably in the third magnitude range but are visible to the naked eye only in very dark skies under good conditions. The brief flashes are too short to be noticed by the naked eye. In binoculars EGP resembles the strobe of an airplane but the flash pattern is more complex than a strobe light. Because of the extremely high orbital altitude of 1,500 kilometers, EGP is often visible closer to midnight than other satellites, and can frequently be seen on as many as four orbits during a single overnight observing session.

16910 EGP ROCKET/BODY: Upper stage from the H-1 rocket that launched the EGP satellite and a small amateur radio secondary payload Fuji 1 / Oscar 12 (FO-12). The R/B is quite large and, therefore, bright (fifth magnitude) for its altitude of 1,500 kilometers. It does not appear to be tumbling and is fairly constant in its brightness.

16969 NOAA 10: Active USA civilian weather satellite in low polar sun-synch orbit. Passes near sunrise and sunset, sometimes visible in evening skies near sixth magnitude. APT radio transmissions can be recieved on 137.500 MHz.

17070 POLAR BEAR: USA NNSS navigation satellite with auroral studies. Was restored from display at the Smithsonian in Washington, DC.

17146 COSMOS 1794-1801 ROCKET/BODY: Flash period of 19 seconds

17480 ASTRO 3: Japanese X-ray astronomy satellite, also known as 'Ginga'.

17527 MOS 1-A: Japanese Maritime Observation Satellite

17589 COSMOS 1833: Soviet Electronic Intellegence (ELINT) satellite

17590 COSMOS 1833 ROCKET/BODY: Soviet SL-16 Zenit booster from launch of ELINT satellite. For generic Zenit information see 20625.

17973 COSMOS 1844: Soviet Electronic Intellegence (ELINT) satellite

17974 COSMOS 1844 ROCKET/BODY: Soviet SL-16 Zenit booster from launch of ELINT satellite. For generic Zenit information see 20625.

18121 COSMOS 1852-1859 ROCKET/BODY: Flash period of 40 seconds

18123 DMSP 2-3: Military weather satellite. For general information on the DMSP series see 20978.

18129 COSMOS 1861: Soviet system-1 navigation satellite. Carries RS/10-11 amateur radio package onboard. Visually near sixth magnitude.

18312 METEOR 2-16: Soviet weather satellite. Visually near sixth magnitude.

18313 METEOR 2-16 ROCKET/BODY: Soviet Tsyklon (Cyclone) rocket/body.

18665 COSMOS 1900: This is the nuclear reactor from the Cosmos 1900 naval reconnoisance satellite. The satellites, which operate in very low orbits, are supposed to jettison their nuclear reactors into a higher stable orbit at the end of their operational mission. Twice the separation systems failed resulting in the re-entry of the nuclear fuel, once into the NWT in Canada, and once into the Indian Ocean. C-1900 failed in orbit and came very close to re-entering before the separation and boost systems activated, keeping the 110 pounds of uranium in orbit as the rest of the spacecraft plunged to Earth. The C-1900 satellite is about fourth magnitude and has a flash period of 10 seconds.

18820 METEOR 2-17: Soviet weather satellite. Visually near sixth magnitude.

18821 METEOR 2-17 ROCKET/BODY: Soviet Tsyklon (Cyclone) rocket/body.

18822 DMSP 2-4: Military weather satellite. For general information on the DMSP series see 20978.

18945 COSMOS 1924-1931 ROCKET/BODY: Flash period of 20.1 seconds

18986 COSMOS 1934 ROCKET/BODY: Flash period of 16.8 seconds

19119 COSMOS 1943: Soviet Electronic Intellegence (ELINT) satellite

19120 COSMOS 1943 ROCKET/BODY: Soviet SL-16 Zenit booster from launch of ELINT satellite. Visually, a tumbler with a period of 20 seconds. For generic Zenit information see 20625.

19257 COSMOS 1954 ROCKET/BODY: Flash period of 48 seconds

19274 OKEAN 1: Soviet oceanographic satellite

19336 METEOR 3-2: Soviet weather satellite. Visually sixth-seventh magnitude.

19467 FENG YUN 1-A: Chinese weather satellite in low polar sun-synch orbit

19531 NOAA 11: Active USA civilian weather satellite in low polar sun-synch orbit. Passes near noon and midnight, sometimes visible over the pole in summer near sixth magnitude. APT radio transmissions can be recieved on 137.650 MHz.

19649 COSMOS 1980: Soviet Electronic Intellegence (ELINT) satellite

19650 COSMOS 1980 ROCKET/BODY: Soviet SL-16 Zenit booster from launch of ELINT satellite. Visually, a tumbler with a period of 40 seconds. For generic Zenit information see 20625.

19671 LACROSSE 1: This 'dark' Department of Defense satellite is actually ruby red. The first Lacrosse satellite was launched aboard the space shuttle Atlantis (mission STS-27) in December 1988 from launch pad 39-B at the Kennedy Space Center. Lacrosse is a radar imaging satellite similar to the Magellan Venus orbiter, but with a much higher resolution. It is considered one of the most important USA military spacecraft. Lacrosse was, at one time, known by the code name Indigo. Visually Lacrosse is, after EGP, the most distinctive satellite in orbit. It is very bright, second magnitude, and a very strong shade of red. At that magnitude the eye can easily see color making the effect even more obvious. Lacrosse is also in the rather high orbit of 670 kilometers, at least high for something so large, so that the combination of color, brightness and apparent speed make it instantly recognizable. Because it is a classified satellite there are no NORAD orbital elements available, but it is quite easy to keep track of the satellite without official help. Its red color was seen while still in Atlantis' cargo bay on mission 27, and it was seen one orbit later after deployment as a red satellite co-orbital with the shuttle. Since that time it has been 'lost' for only a very short period of time, just after launch. Lacrosse is one of the most interesting satellites to observe.

19826 COSMOS 2004: Soviet System-2 navigation satellite

19827 COSMOS 2004 ROCKET/BODY: From launch of navigation satellite. Tumbler, with a flash period of 40.6 seconds.

19851 METEOR 2-18: Soviet weather satellite. Visually near sixth magnitude.

19910 COSMOS 2008-2015 ROCKET/BODY: Tumbler, flash period of 6.35 seconds

19911 DELTA STAR: This is a 'gray' Department of Defense satellite which NORAD releases orbital data on. It is a research and development satellite for the Strategic Defense Initiative, better known as Star Wars. The name is derived from its Delta launch vehicle.

19921 COSMOS 2016: Soviet System-2 navigaton satellite

19922 COSMOS 2016 ROCKET/BODY: From launch of navigation satellite. Tumbler, with a flash period of 17.2 seconds.

20045 COSMOS 2026: Soviet System-2 navigation satellite

20046 COSMOS 2026 ROCKET/BODY: From launch of navigation satellite. Tumbler, with a flash period of 23 seconds.

20064 COSMOS 2027: Soviet Electronic Intellegence (ELINT) satellite

20103 NADEZHDA 1: Soviet navigation satellite. The satellite is named (translation=Hope) for an onboard COSPAS/SARSAT package that locates emergency beacons.

20149 COSMOS 2034: Soviet system-2 navigation satellite

20150 COSMOS 2034 ROCKET/BODY: From launch of navigation satellite. Tumbler, with a lighthouse appearance, flash period of 4.7 seconds.

20197 COSMOS 2037 ROCKET/BODY: From launch of Soviet geodetic satellite. Tumbler, flash period of 0.8 seconds.

20259 COSMOS 2046: Soviet Electronic Ocean Reconnaissance Satellite (EORSAT); very bright first-magnitude satellite.

20261 INTERCOSMOS 24: Joint Soviet / eastern block scientific satellite to study the magnetosphere and the propogation of low radio frequencies.

20262 INTERCOSMOS 24 ROCKET/BODY: Soviet Tsyklon (Cyclone) third stage rocket/body from launch of Intercosmos 24 and Magion subsatellite.

20303 GPS 2-4 ROCKET/BODY: Delta-II second stage from launch of fourth block-2 GPS-Navstar navigation satellite. The GPS (Global Positioning System) series is a USA Department of Defense constellation of navigation satellites in circular 12-hour orbits. The primary use of GPS is for military navigation, but civilian users are allowed limited use of the satellites. The block-2 GPS-Navstar satellites are launched on the new Delta-II rocket. The second stage from the Delta remains in an eccentric parking orbit near 400x1000 km for some launches, depending on the payload's destination orbital plane. On some launches the parking orbit perigee is much lower and the second stage quickly decays. Visually the GPS RBs are fairly predictable in brightness, in the third to sixth magnitude range depending on altitude and solar illumination. They do not appear to be tumbling and maintain a steady brightness during a pass. The second stage is actually blue-green, and carries the GPS, McDonnell Douglas and USAF logos, but any color is very hard to detect in orbit.

20305 METEOR 3-3: Soviet weather satellite. Visually sixth-seventh magnitude.

20322 COBE (COsmic Background Explorer): COBE's mission is to explore the residual background radiation from the big bang. It has measured the smoothness of the background and shown that the early universe was homogenous to a degree beyond the measuring capability of any previous instrument. COBE was launched on a Delta rocket from Vandenberg Air Force Base in California. Visually COBE is a rather erratic satellite, often in the fourth magnitude range, but under certain lighting conditions it will be near first magnitude. These changes seem unrelated to the illumination phase. When it is bright its magnitude cycles between about first and third magnitude as COBE spins. Under most conditions COBE's spin does not appear to create a light curve. COBE is in a sun-synchronous orbit.

20362 GPS 2-5 ROCKET/BODY: Delta-II second stage from the launch of the fifth block-2 GPS-Navstar navigation satellite in December 1989 from the Cape Canaveral Air Force Station. For general information on GPS RBs see 20303.

20406 JCSAT 2 ROCKET/BODY: The modified Minuteman-III third stage, similar to the Leasat RBs, used as an upper stage for the Japanese communications satellite JCSAT. Launched from CCAFS pad 40 aboard the first commercial Titan rocket on new year's eve 1989.

20411 LEASAT 5 ROCKET/BODY: The Leasat R/Bs are modified Minuteman-III third stages used as a perigee kick motor for the Leasat (also known as Syncom) communications satellites. Leasat 5 was launched in January 1990 aboard the space shuttle Columbia on mission STS-32, a flight that included the recovery of the LDEF satellite. Visually the R/B has a firefly appearance in the fourth magnitude range at perigee. The Leasat RBs are in eccentric GTO orbits and are only good visual targets when close to perigee.

20432 COSMOS 2056: Soviet store/dump communications satellite

20433 COSMOS 2056 ROCKET/BODY: From launch of store/dump comsat. Flash period of 4.1 seconds.

20436 SPOT 2: European commercial earth resources satellite in polar sun-synch orbit; launched on Ariane rocket

20443 SPOT 2 ROCKET/BODY: Ariane rocket/body from launch of Spot 2 earth resources satellite and six small amateur radio satellites.

20453 GPS 2-6 ROCKET/BODY: Delta-II second stage from the launch of sixth block-2 GPS-Navstar navigation satellite from the Cape Canaveral Air Force Station. GPS 2-6 was launched just after sunset on January 24, 1990, and broke into daylight during ascent. For general information on GPS RBs see 20303.

20465 COSMOS 2058: Soviet Electronic Intellegence (ELINT) satellite

20478 MOS 1-B: Japanese Maritime Observation Satellite

20479 ORIZURU (DEBUT): Japanese Deployable Boom and Umbrella Test. Technology development satellite.

20491 MOS 1-B ROCKET/BODY: Japanese H-1 rocket/body from launch of MOS 1-B, Orizuru and a small Fuji amateur radio satellite

20496 LACE: USA Laser Atmospheric Compensation Experiment launched on Delta rocket with RME. A star wars test satellite for development of laser technology. Visually in the fourth magnitude range with a slightly reddish hue.

20497 RME: USA Relay Mirror Experiment launched on Delta with LACE. Carries a 2-foot diameter mirror for star wars testing.

20508 NADEZHDA 2: Soviet navigation satellite. The satellite is named (translation=Hope) for an onboard COSPAS/SARSAT package that locates emergency beacons.

20509 NADEZHDA 2 ROCKET/BODY: Tumbler with a flash period of 20.5 seconds

20510 OKEAN 2: Soviet oceanographic satellite

20523 INTELSAT 6-3: This international communications satellite was left stranded in low orbit when its booster, the second Commercial Titan rocket (similar to the Titan-III), failed to separate the satellite from the second stage. The Titan/Intelsat combination was in a very low parking orbit so the only way to save the payload was to order spacecraft separation from the

Intelsat's third stage perigee kick motor. The Titan second stage refused all commands to separate from the third stage, which is not part of the Titan launch vehicle and is considered to be payload at that stage in the launch process. The Intelsat was separated from the third stage and moved into a higher parking orbit where it can compensate for atmospheric drag by using its onboard manoevering fuel. The burned-out Titan second stage, and the Intelsat's third stage which was still firmly bolted to the Titan, re-entered 14 days after launch. Intelsat 6-3 is awaiting a shuttle rescue, presently scheduled for the first flight of the new orbiter Endeavour in 1992. The shuttle will carry a new third stage to Intelsat and place it on the satellite so that it will reach its operational geostationary orbit. Until it is rescued, satellite observers have a very rare opportunity to see a geosynch communications satellite at close range -- some 60 times closer, and nine magnitudes brighter, than its intended orbit. Intelsat 6 satellites are spin stabilized, and Intelsat 6-3 goes through a very noticeable light curve from most perspectives. Its theoretical magnitude is third, but it is more often either brighter or fainter than predicted. From some angles it goes through some very bright glints. It normally gives only three or four flashes before its orbital motion takes it away from that angle. If the satellite is observed on the following days, it will almost always produce a similar series of flases in the same part of the sky.

20525 COSMOS 2060: Soviet Electronic Ocean Reconnaissance Satellite (EORSAT); very bright first-magnitude satellite.

20527 COSMOS 2061: Soviet system-2 navigation satellite

20528 COSMOS 2061 ROCKET/BODY: From launch of navigation satellite. Flash period of 17.9 seconds.

20546 PEGSAT: This is the rocket/body, with an attached payload, from the first orbital rocket ever launched from the air. The privately developed Pegasus booster is dropped from a B-52 over the Pacific Ocean and then fires itself into orbit. A chemical release payload is attached to the spent rocket casing, and a small Department of Defense GLOMR satellite was deployed into a separate orbit. Pegsat is visually an interesting satellite, with a very large magnitude range from maximum to minimum, and a 2-second period to complete an entire cycle. Pegsat is in a sun-synchronous orbit.

20557 COSMOS 2064-2071 ROCKET/BODY: Flash period 12.4 seconds.

20571 PALAPA 6 ROCKET/BODY: Delta second-stage from the relaunch of the Indian Palapa satellite stranded (see 14693) and recovered by the shuttle.

20577 COSMOS 2074: Soviet system-2 navigation satellite

20580 HUBBLE SPACE TELESCOPE (HST): HST was launched aboard the space shuttle Discovery (mission STS-31) in April 1990 from launch pad 39-B at the Kennedy Space Center. HST is mankind's best optical telescope despite the serious spherical abberation that has left it unable to achieve its theoretical capabilities. HST is scheduled to be revisted by the shuttle several times during its 15-year orbital life. The purpose of these visits, planned long before the spherical abberation was discovered, are to boost HST's orbit and

replace the scientific instruments with more advanced designs. HST has no onboard propellant at all and is purely ballistic; it does not have the ability to boost its orbit periodically to compensate for atmospheric drag. The reason for this is that any residual propellants in HST's orbit could damage its optical instruments. HST must be revisited by the shuttle every few years to reboost it to its original altitude of over 600 kilometers; otherwise it will be destroyed on reentry, as happened to Skylab and Solar Max, and could have happened to LDEF. It has been expected that better instruments could be built for HST during its 15-year lifetime, so NASA planned to make use of the revisit missions to swap some of the scientific experiments while the shuttle was there. This capability will be utilized to partially 'fix' HST on the first revisit mission by replacing the primary camera with a replacement that will compensate for the spherical abberation. Visually HST is rarely fainter than third magnitude on favorable passes, and is more frequently in the first magnitude range. Each of the two solar panels is as large as the telescope itself, and these are held perpendicular to the Sun, so the illumination phase of HST is very important in predicting its brightness. When HST is seen at a high phase (in the east after sunset or the west before sunrise) there are sometimes very brilliant glints off the solar panels, sometimes as bright as magnitude -4. HST's orbital inclination of 28 degrees means it never passes directly over most of the United States, but it can be seen in binoculars even at elevations of 10 degrees, so it can be seen by ambitious observers in very northern latitudes.

20582 COSMOS 2075 ROCKET/BODY: Flash period of 4 seconds

20624 COSMOS 2082: Soviet Electronic Intellegence (ELINT) satellite

20625 COSMOS 2082 ROCKET/BODY: This SL-16 Zenit rocket boosted a Soviet ELINT spacecraft. The R/B is a very rapid tumbler, with a flash period of 1.3 seconds, and slowing due to interaction with the magnetic field. The Zenit boosters are among the largest objects in orbit and easily naked-eye, often close to second magnitude at maximum.

20638 ROSAT: The Rosat (Roentgen Satellite) is a German X-ray telescope launched on a Delta-II rocket from the Cape Canaveral Air Force Station in June 1990. Rosat is the most advanced X-ray telescope ever launched. It was initially planned for a shuttle launch and the reconfiguration to an unmanned launch vehicle delayed its flight by several years. There is significant American and British involvement in Rosat. Visually Rosat has a very strong yellow-gold hue because of the insulation that covers almost all of the spacecraft. It is typically in the fourth magnitude range but has been seen as bright as first magnitude.

20639 ROSAT ROCKET/BODY: Delta second-stage from launch of Rosat

20663 COSMOS 2084: This is a Soviet satellite intended for a Molniya orbit which was left stranded in a 600-kilometer altitude orbit due to a booster failure (see 20664). C-2084 is believed to be an early-warning military spacecraft. Observers of this satellite have a unique opportunity to observe a Molniya-orbit satellite at close range. Visually it is in the fourth magnitude range.

20664 COSMOS 2084 ROCKET/BODY: This is the fourth stage perigee kick motor that was to have boosted Cosmos 2084 from its parking orbit into a Molniya orbit. It apparently shut down shortly after ignition and then separated from the payload, leaving it in a useless but stable low orbit. As with the payload, observers have here a unique opportunity to observe the upper stage at close range. Visually it is a tumbling object, easily naked-eye at maximum.

20670 METEOR 2-19: Soviet weather satellite. Visually near sixth magnitude.

20683 GAMMA: Large Soviet gamma-ray astronomical telescope. Second magnitude satellite.

20712 CRRES: Joint NASA/USAF Combined Release and Radiation Effects Satellite. The NASA program is a series of chemical releases of Barium and Lithium into the magnetosphere; the unclassified USAF program is research and development testing of new materials and electronic parts to determine the effects of the space environment for future spacecraft design.

20775 COSMOS 2098 ROCKET/BODY: Flash period of 2.3 seconds

20788 FENG YUN 1-B: Chinese weather satellite in low polar sun-synch orbit

20789 ATMOSPHERE 1 and 20790 ATMOSPHERE 2: These are two passive balloons launched by China as piggyback payloads on the Feng Yun 1-B rocket in September 1990. The satellites are about 10 feet in diameter. Their mission is to measure the density of the upper atmosphere at orbital altitudes by observing the air's drag effect on their orbits. Atmosphere 1 is near re-entry, but Atmosphere 2 is still safely in orbit. The two are in the fourth magnitude range and starting to show unstable brightnesses as the balloons start to deform.

20791 FENG YUN 1-B ROCKET/BODY: This Chinese booster exploded in orbit, well after deploying the Feng Yun 1-B weather satellite and two small balloon secondary payloads. None of the payloads were damaged by the explosion, which produced about 75 pieces of debris large enough to be tracked by NORAD. The largest piece of the R/B, 20791, now has a very complex light curve. This is visually one of the most interesting satellites in orbit. The flash period, that is, the time for the brightness variations to repeat, has been measured at three seconds. Some of the glints can get fairly bright when seen from a good perspective.

20843 ULYSSES ROCKET/BODY: The IUS (Intertial Upper Stage) first-stage from the launch of the Ulysses interplanetary spacecraft, en route to Jupiter for a gravity assisted plane change to enter the intended polar heliocentric orbit for study of the Sun's magnetic field. 20843 has remained in Earth orbit, in GTO, and is an interesting historic object to sight at perigee. Ulysses was launched in October 1990 aboard the space shuttle Discovery on mission STS-41.

20919 INMARSAT 2-1 ROCKET/BODY: Delta-II second stage from the launch of the first dedicated Inmarsat communications satellite (previous Inmarsat payloads have piggybacked on other comsats). The launch vehicle was the 200th Delta rocket.

20960 GPS 2-10 ROCKET/BODY: Delta-II second stage from the launch of the tenth block-2 GPS-Navstar navigation satellite from the Cape Canaveral Air Force Station. This was the first flight of a Delta with the uprated larger solid boosters, and the increased payload capacity was partly used to reduce the inclination of the parking orbit to 21 degrees. For general information on GPS RBs see 20303.

20978 DMSP 2-5: Military weather satellite (Defense Meteorology Support Program). The DMSP satellites are in low polar sun-synch orbits and similar in size to the civilian NOAA weather satellites. Their orbits are not classified. Visually DMSP satellites are in the sixth magnitude range.

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1036. SAREX Keps 7/13 at 10:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 10:10:01 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.008.1994@ampr.org>
Source record: 27337
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.008
SAREX Keps 7/13 at 10:00 UTC

Silver Spring. MD 7/13 at 10:00 UTC

At this time, the official Orbital element set for the STS-65 Space Shuttle
Mission is set GSFC-014. This set was generated by Ron Parise, WA4SIR at
the Goddard Space Flight Center.

STS-65
1 23173U 94039A 94193.26085228 0.00002036 00000-0 47272-5 0 146
2 23173 28.4704 341.0586 0002767 343.5572 16.4949 15.90437602 584

Satellite: STS-65
Catalog number: 23173
Epoch time: 94193.26085228 (12 JUL 94 06:15:37.64 UTC)
Element set: GSFC-014
Inclination: 28.4704 deg
RA of node: 341.0586 deg Space Shuttle Flight STS-65
Eccentricity: 0.0002767 Keplerian Elements
Arg of perigee: 343.5572 deg
Mean anomaly: 16.4949 deg
Mean motion: 15.90437602 rev/day Semi-major Axis: 6679.1896 Km
Decay rate: 0.20E-04 rev/day*2 Apogee Alt: 302.65 Km
Epoch rev: 58 Perigee Alt: 298.95 Km

NOTE - This element set is based on NORAD element set # 014.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1037. Re: Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 14:24:17 UTC
From: <>
Message-ID: <300teh$1g3@wizard.uark.edu>
Source record: 27339

n4zr@netcom.com (Peter G. Smith) writes:

>Apollo 11 25th Anniversary Amateur Radio Special Event Station Activity

>At 1627 EDT, Sunday afternoon, July 20, 1969, astronaut Neil A. Armstrong
>spoke the words "Houston, Tranquility Base here. The Eagle has landed."
>At 2256 EDT, later the same day, Armstrong stepped down from the ladder
>of the Lunar Module onto the Moon's surface and spoke the words, "That's
>one small step for a man, one giant leap for mankind."
^

Historical revisionist! He omitted the 'a' in his excitement ...

Peter Laws <plaws@comp.uark.edu> |"Let's make sure history never forgets the
n5uwy@ka5bml.#nwar.ar.usa.noam | name ... Enterprise" ST:TNG - 1987-1994

1038. Re: Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 15:55:00 UTC
From: laborde@kilroy.jpl.nasa.gov
Message-ID: <laborde-130794085500@128.149.100.84>
Source record: 27341

In article <300teh$1g3@wizard.uark.edu>, plaws@comp..uark.edu (Peter Laws) wrote:

> Historical revisionist! He omitted the 'a' in his excitement ...

Peter, Armstrong maintains that he said 'a' and that it was lost in the noise of the transmission. Listening to the tape, how will we ever know?

--
Gregory R. LaBorde
laborde@kilroy.jpl.nasa.gov
(818) 393-1107
Amateur Call: KD6MSM

1039. Re: KLM vs. M2 antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 17:30:15 UTC
From: ericr@access3.digex.net
Message-ID: <ericr.774120530@access3>
Source record: 27342

M2 makes a long 2 meter antenna that is, IMHO, far superior to the KLM -22C.
Designed by the smae person, Mike Staal (K6MYC) years later, the M2
antenna is more robust in construction.

Eric

1040. Re: Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 18:00:50 UTC
From: rspear@sookit
Message-ID: <301a4i$ai7@netline-fddi.jpl.nasa.gov>
Source record: 27344

Gregory R. LaBorde (laborde@kilroy.jpl.nasa.gov) wrote:
: In article <300teh$1g3@wizard.uark.edu>, plaws@comp..uark.edu (Peter Laws)
: wrote:

: > Historical revisionist! He omitted the 'a' in his excitement ...

: Peter, Armstrong maintains that he said 'a' and that it was lost in the
: noise of the transmission. Listening to the tape, how will we ever know?

: --
: Gregory R. LaBorde
: laborde@kilroy.jpl.nasa.gov
: (818) 393-1107
: Amateur Call: KD6MSM

hmmm greg, i thought he blamed the vox for losing the "a" ...

regards, richard

rspear@sookit.jpl.nasa.gov
all disclaimers apply

1041. Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 19:53:11 UTC
From: n4zr@netcom.com
Message-ID: <n4zrCsw9wo.E2n@netcom.com>
Source record: 27343
Cross-posted to: rec.radio.amateur.space,rec.radio.info

Apollo 11 25th Anniversary Amateur Radio Special Event Station Activity

At 1627 EDT, Sunday afternoon, July 20, 1969, astronaut Neil A. Armstrong spoke the words "Houston, Tranquility Base here. The Eagle has landed." At 2256 EDT, later the same day, Armstrong stepped down from the ladder of the Lunar Module onto the Moon's surface and spoke the words, "That's one small step for a man, one giant leap for mankind."

To commemorate that historic event twenty-five years ago next week, amateur radio clubs and groups at NASA Headquarters and the various NASA field centers will be on the air as "Special Event Stations", contacting amateur radio operators around the world.

Amateur Radio clubs or groups from twelve NASA locations are currently preparing for the 60-hour special event operating period from their respective facilities. Ham groups from other NASA locations may also be on-line to participate by the time the special event period arrives. This is the first time so many NASA stations will be represented on the air at one time. Contacts with these stations during the special event period will be confirmed on request with a certificate to commemorate man's first steps on the Moon and the special event activity.

Details:

Event Name:
Apollo 11 Moon Landing 25th Anniversary

Date/Time Period:
1700Z, July 19 through 0500Z, July 22
(1300 EDT, July 19 through 0100, July 22)

Modes:
CW, SSB, FM, Packet, Pactor, Amtor, RTTY, SSTV, ATV, Satellites.

Frequencies:
HF CW/SSB: Check 11 (as in Apollo 11) kHz up from the bottom of the General Class portion of the amateur radio bands (except 10m SSB: 28.411+ MHz).

Other Modes:
Check modes/frequencies as indicated by the individual stations below.

QSL Information:
A certificate is being designed to commemorate this special event activity, which will be individualized for each special event station.

Domestic Stations: Send a 9" x 12" self-addressed, stamped envelope to
the callbook address (CBA) of the station worked or to the address
specified by the station worked. Attach $0.52 postage to cover
return mailing.

DX Stations: Send a 9" x 12" self-addressed envelope to the
appropriate address, with sufficient IRC's or U.S. Postage for return
mailing of up to 1.5 oz (42.52 grams).
Europe = $1.40US postage (3 IRC);
Mexico = $0.63US postage (2 IRC);
Canada = $0.55US (2 IRC).

Individual Station Specifics:
==========

Ames Amateur Radio Club,
NASA Ames Research Center, Moffett Field, CA
Callsign: K6MF
Bands: 40-10m (excl. WARC), 2m
Modes: CW, SSB, FM
Special Freqs: 145.585 MHz
QSL Address: AARC
Box 73
Moffett Field, CA 94035-1000

Dryden Amateur Radio Club,
NASA Dryden Flight Research Center, Edwards, CA
Callsign: KF7GD
Bands: 80-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m SSB: 144.25 MHz; FM: 146.55 MHz
QSL Address: NASA DFRC
Attn: Dryden ARC
POB 273
Edwards, CA 93523

Goddard Amateur Radio Club, Inc.,
NASA Goddard Space Flight Center, Greenbelt, MD
Callsign: WA3NAN
Bands: 160-10m (incl WARC), 2m
Modes: CW, SSB
Special Freqs: 2m: 146.58 FM Simplex
QSL Address: Callbook Address, or
GARC
P.O. Box 86
Greenbelt, MD 20768-0086

Guam Contingency Landing Site Amateur Radio Group
Guam
Callsign: KC4YDP/KH2
Bands: 80-10m (incl WARC)
Modes: CW, SSB
Special Freqs:

QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Headquarters Amateur Radio Group
Washington, D.C.
Callsign: N4ZR
Bands: 80-10 (incl WARC)
Modes: CW, SSB
Special Freqs:
QSL Address: CBA
N4ZR
2003 Sarazen Place
Reston, VA 22091-3809

Jet Propulsion Laboratory Amateur Radio Club and
Goldstone Amateur Radio Club
Jet Propulsion Laboratory, Pasadena, CA
Callsign: W6VIO
Bands: 80-10 (incl WARC), 2m
Modes: CW, SSB, Amtor, Packet, RTTY, Pactor
Special Freqs: SSTV: 14.230 MHz
Packet Node/BBS (W6VIO-1):
144.090/223.540 MHz
2m Repeaters (freq in MHz):
(W6VIO) 147.15+/224.72-
(WB6TZS)145.28-/223.96-/447.325-
Satellites: AO10/13/LEOS SSB/CW
QSL Address: Jet Propulsion Laboratory Amateur Radio Club
M/S 168-327
4800 Oak Grove Dr.
Pasadena, Ca. 91109

Johnson Space Center Amateur Radio Club
NASA Johnson Space Center, Houston, TX
Callsign: W5RRR
Bands: 80-10 (incl WARC), 2m, 70cm
Modes: CW, SSB, FM, Digital Modes,
SSTV, ATV, Satellites
Special Freqs: 2m repeaters
QSL Address: JSC ARC/W5RRR
Johnson Space Center
Houston, Texas 77058
BBS: (713)244-5625

Kennedy Space Center Amateur Radio Group
Kennedy Space Center, FL
Callsign: KC4TCV (SSB) / AD4NA (CW)
Bands: 160-10m (incl WARC)
Modes: CW, SSB, Pactor, RTTY, Satellites
Special Freqs: Packet: 145.09 MHz;

2m Repeater 146.34/.94, 146.31/.91, 146.96/.36
QSL Address: NASA
RADIO
Kennedy Space Center, Florida 32899

NASA Lewis Amateur Radio Club (NLARC)
NASA Lewis Research Center, Cleveland, OH
Callsign: AK8Y
Bands: 80-10m
Modes: CW, SSB, RTTY, Amtor, Pactor, FM, Satellites
Special Freqs: Repeaters: 147.195+/444.1 MHz
RTTY: 14.080-90MHz
Amtor/Pactor: 14.060-80MHz.
Packet: 145.01MHz (call: AK8Y-8)
QSL Address: NASA Lewis Amateur Radio Club
21000 Brookpark Rd, MS 54-6
Cleveland, OH 44135
Attn: Don Hilderman

Marshall Amateur Radio Club
NASA Marshall Space Flight Center, Huntsville, AL
Callsign: WA4NZD
Bands: 160-6m (incl WARC)
Modes: Primarily SSB
Special Freqs: 6m: 50.130 MHz; Oscar 13, Mode B
QSL Address: Marshall Amateur Radio Club
CM21X
MSFC, AL 35812
Phone Message: (205)544-7568

Stennis Space Center Amateur Radio Club
NASA Stennis Space Center, MS
Callsign: K5GY
Bands: 40-10m (no WARC), 2m
Modes: CW, SSB, Novice Bands, Packet
Special Freqs: 2m repeater: 146.70 MHz
QSL Address: Stennis Space Center Amateur Radio Club
Bldg 1201
Stennis Space Center, MS 39529

Wallops Island Amateur Radio Club
NASA Wallops Flight Facility, Wallops Island, VA
Callsign: KE3ND
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs: 2m: 147.55MHz simplex
QSL Address: Wallops Island ARC
NASA Wallops Flight Facility
Building E-134
Wallops Island, VA 23337

White Sands Complex Amateur Radio Group
NASA White Sands Test Facility, Las Cruces, NM
Callsign: KF7E
Bands: 80-10m (incl WARC)
Modes: CW/SSB
Special Freqs:
QSL Address: KF7E
P.O. Box 627
Organ, NM 88052

--
73, Pete
N4ZR@netcom.com

1042. 70cm Microsats

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 21:15:44 UTC
From: "Colin Schmutter"
Message-ID: <CswDq9.MuM@epaus.island.net>
Source record: 27346

I have started taking an interest in the microsats, mainly those with mode J configuration.

I have been monitoring the downlink signals using a J-pole antenna and 70 cm pre-amp (homebrew ARRL handbook designs) and an AOR 2002 scanner set to NBFM to get an idea of the downlink signal strength.

I have found the signals to be very weak using the above and the S meter on the receiver barely lights, even at mid pass.

I have monitored LO19, AO16, KO23, KO25 and others and they all seem very weak.

Given the above configuration would this be what I should expect as far as downlink signal strength.

I didn't want to spend any money on modems etc until I am sure that I have the RF side of things set up correctly.

Any comments would be appreciated.

Colin Schmutter

shmc0874@bcit.bc.ca

1043. 70cm Microsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 21:20:57 UTC
From: "Colin Schmutter"
Message-ID: <CswDyy.n01@epaus.island.net>
Source record: 27347

I have started taking an interest in the microsats, mainly those with mode J configuration.

I have been monitoring the downlink signals using a J-pole antenna and 70 cm pre-amp (homebrew ARRL handbook designs) and an AOR 2002 scanner set to NBFM to get an idea of the downlink signal strength.

I have found the signals to be very weak using the above and the S meter on the receiver barely lights, even at mid pass.

I have monitored LO19, AO16, KO23, KO25 and others and they all seem very weak.

Given the above configuration would this be what I should expect as far as downlink signal strength.

I didn't want to spend any money on modems etc until I am sure that I have the RF side of things set up correctly.

Any comments would be appreciated.

Colin Schmutter

shmc0874@bcit.bc.ca

1044. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 21:59:38 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774136778@afit.af.mil>
Source record: 27348

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94194.25000000 .00002000 00000-0 45889-5 0 199
2 23173 28.4706 333.6645 0002881 354.5222 281.2916 15.90536651 726
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1045. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 21:59:57 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774136797@afit.af.mil>
Source record: 27205
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94194.25000000 .00002000 00000-0 45889-5 0 199
2 23173 28.4706 333.6645 0002881 354.5222 281.2916 15.90536651 726
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1046. STS-65 Orbital State Vector Rev #82

Newsgroup: rec.radio.amateur.space
Date: 1994-07-13 23:59:15 UTC
From: astroman@netcom.com
Message-ID: <astromanCswLAs.5LH@netcom.com>
Source record: 27345
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94194.79491696759
07/13/1994 19:04:40.826 UTC
EFG E: 2545778.38 ft
F: -21538885.41 ft
G: 3090853.28 ft
Edot: 20986.7638 ft/s
Fdot: 804.2519 ft/s
Gdot: -11550.8122 ft/s
ndot/2 (drag): 0.00077907287 rev/day^2
nddt/6: 2.54640E-08 rev/day^3
Bstar: 2.38803E-04 1/Earth Radii
Elset #: 15
Rev @ Epoch: 82.45196854969

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1047. Re: Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 06:37:36 UTC
From: jmc@SAIL.Stanford.EDU
Message-ID: <JMC.94Jul13233736@SAIL.Stanford.EDU>
Source record: 27349

What a pity there is no moon base on the 20th anniversary of Apollo.
--
John McCarthy, Computer Science Department, Stanford, CA 94305
*
He who refuses to do arithmetic is doomed to talk nonsense.

1048. STS-65 Element Set (94195.268)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 13:15:54 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94195.268@alsys.com>
Source record: 27350
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94195.26844974 +.00001893 00000-0 42328-5 0 214
2 23173 28.4698 326.0521 0003007 4.5128 355.5510 15.90636199 906

Satellite: STS-65
Catalog number: 23173
Epoch time: 94195.26844974 (14 JUL 94 06:26:34.06 UTC)
Element set: GSFC-021
Inclination: 28.4698 deg
RA of node: 326.0521 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003007 Keplerian Elements
Arg of perigee: 4.5128 deg
Mean anomaly: 355.5510 deg
Mean motion: 15.90636199 rev/day Semi-major Axis: 6678.6337 Km
Decay rate: 0.19E-04 rev/day*2 Apogee Alt: 302.25 Km
Epoch rev: 90 Perigee Alt: 298.24 Km

(for Shuttle Elements subscription info, email: listserv@alsys.com)

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1049. Re: 70cm Microsats

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 14:21:51 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Jul14.142151.11501@ke4zv.atl.ga.us>
Source record: 27352

In article <CswDq9.MuM@epaus.island.net> Colin Schmutter writes:
>I have started taking an interest in the microsats, mainly those with mode J
>configuration.
>
>I have been monitoring the downlink signals using a J-pole antenna and 70 cm
>pre-amp (homebrew ARRL handbook designs) and an AOR 2002 scanner set to NBFM
>to get an idea of the downlink signal strength.
>
>I have found the signals to be very weak using the above and the S meter on the
>receiver barely lights, even at mid pass.
>
>I have monitored LO19, AO16, KO23, KO25 and others and they all seem very weak.
>
>Given the above configuration would this be what I should expect as far as
>downlink signal strength.

This doesn't sound good. I get noisy signals with just a BC760xlt
scanner and it's little whip antenna indoors. With the FT736 and a
Comet 2X4Max with no preamp, I get signal strengths of S3-S5 during
the lower part of the pass. I get almost no signal when the birds are
overhead with the Comet omni antenna (it's pattern is optimized toward
the horizon). With a tracking KLM40CX and SSB Electronics Gasfet preamp,
S9++ signals are the norm.

I don't know how deaf the AOR 2002 is, you might want to try a better
radio, like a HT, to eliminate that variable. If the signals are still
weak, you should check your preamp and feedline. A J-pole *should* be
enough antenna to give good signals during at least part of the pass.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

1050. Re: Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 15:42:34 UTC
From: laborde@kilroy.jpl.nasa.gov
Message-ID: <laborde-140794084234@kd6msm.jpl.nasa.gov>
Source record: 27351

In article <JMC.94Jul13233736@SAIL.Stanford.EDU>, jmc@SAIL.Stanford.EDU
(John McCarthy) wrote:

> What a pity there is no moon base on the 20th anniversary of Apollo.

And not on the 25th anniversary, either.

--
Gregory R. LaBorde
laborde@kilroy.jpl.nasa.gov
(818) 393-1107
Amateur Call: KD6MSM

1051. STS-65 Keps 7/14 at 15:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 15:45:03 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.009.1994@ampr.org>
Source record: 27208
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SAREX @ AMSAT $STS-65.009
SAREX Keps 7/14 at 15:30 UTC

Greenbelt, MD 7/14 at 15:30 UTC

At this time, the official Orbital element set for the STS-65 Space Shuttle
Mission is set GSFC-021. This set was generated by Ron Parise, WA4SIR at
the Goddard Space Flight Center.

STS-65
1 23173U 94039A 94195.26844974 0.00001893 00000-0 42328-5 0 214
2 23173 28.4698 326.0521 0003007 4.5128 355.5510 15.90636199 906

Satellite: STS-65
Catalog number: 23173
Epoch time: 94195.26844974 (14 JUL 94 06:26:34.06 UTC)
Element set: GSFC-021
Inclination: 28.4698 deg
RA of node: 326.0521 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003007 Keplerian Elements
Arg of perigee: 4.5128 deg
Mean anomaly: 355.5510 deg
Mean motion: 15.90636199 rev/day Semi-major Axis: 6678.6337 Km
Decay rate: 0.19E-04 rev/day*2 Apogee Alt: 302.25 Km
Epoch rev: 90 Perigee Alt: 298.24 Km

NOTE - This element set is based on NORAD element set # 021.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX
```

1052. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 23:34:57 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774228897@afit.af.mil>
Source record: 27353

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94195.25000000 .00001893 00000-0 42328-5 0 217
2 23173 28.4698 326.1900 0003008 4.2858 249.9049 15.90636156 889
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1053. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-14 23:35:14 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774228914@afit.af.mil>
Source record: 27201
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94195.25000000 .00001893 00000-0 42328-5 0 217
2 23173 28.4698 326.1900 0003008 4.2858 249.9049 15.90636156 889
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1054. Alaska EME Ham

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 01:29:26 UTC
From: mm1@hounix.org
Message-ID: <1994Jul15.012926.19799@hounix.org>
Source record: 27354

A few weeks ago, my wife and I were visiting friends in anchorage, Alaska.
While out and about, I came across a large 2 meter EME array. I tried the
door of the house, but no one was home. I never did get another chance to go
back to his house. I did take a couple of pictures of his array.
I would like to get in touch with him, if possible via mail, packet, or
Internet.
He lives near Merrial Field (We could watch the planes take off and land).
The EME array is on a crank up tower and he has another (approx 50') tower
with a tri-bander and a diskcone VHF ant on top of that.
His house is a light brown with dark brown trim.
He lives on a corner lot and the array is almost in his front yard.

Dummy me, I didn't write down his address or the two streets his house is on.

John Donaldson - WB5DGQ

--
****
* John Donaldson one very Happy MM/1 Owner *
* send mail to: mm1@Hounix.org INTERNET *
* john@wb5dgq.hounix.org UUCP *

1055. FO-20 TELEMTRY QSL INFO

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 03:41:00 UTC
From: alan.lyday@aquila.com
Message-ID: <f.544.2582@aquila.com>
Source record: 27359

Does anyone have the QSL information for FO-20 telemtry ?
Thanks ahead of time. 73 de WC9C AL
* RM 1.3 00559 *

1056. TAPR/AMSAT DSP-93 Kit Announcement

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 07:17:09 UTC
From: gjones@tcet.unt.edu
Message-ID: <305d5l$bv5@hermes.unt.edu>
Source record: 27355

```
DSP-93
The TAPR/AMSAT Joint DSP Program
------------------------------------------------------------------------
In July 1988, TAPR and AMSAT entered into the Joint DSP Program, in order to
fund the development of an eventual DSP unit for amateur usage. As of the
1993 Dayton Hamvention, the direction of development was focused on a
modular, standalone DSP system proposed by Bob Stricklin, N5BRG, in Dallas,
Texas. The Stricklin KISS design, later renamed DSP-93, offered many of the
things that the initial design goals of the project had specified. Fifteen
months after the decision was made to proceed with the DSP-93 development,
TAPR and AMSAT are both proud to announce that orders for kits will be
taking place July 15th through August 31st for the first 150 units.
The DSP-93 is a complete kit (including box and power supply).

---

If you would like the full announcement, drop me an e-mail and I will
forward it. It is a little long.

Cheers - Greg

---
gjones@tenet.edu
```

1057. STS-65 Orbital State Vector Rev #99

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 10:06:08 UTC
From: astroman@netcom.com
Message-ID: <astromanCsz829.GuB@netcom.com>
Source record: 27356
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 7
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94195.83659266204
07/14/1994 20:04:41.606 UTC
ECI X: 6180.686347 km
Y: -2258.303161 km
Z: 1108.640000 km
Xdot: 1.814990251 km/s
Ydot: 6.677693429 km/s
Zdot: 3.456698000 km/s
ndot/2 (drag): 0.00079221757 rev/day^2
nddt/6: 2.63287E-08 rev/day^3
Bstar: 2.41420E-04 1/Earth Radii
Elset #: 18
Rev @ Epoch: 99.05682417339

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1058. Guide to the Personal Radio Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 11:01:28 UTC
From: pschleck@unomaha.edu
Message-ID: <radio/personal-intro-1-774270084@unomaha.edu>
Source record: 27357
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.antenna,rec.radio.amateur.digital.misc,rec.radio.amateur.equipment,rec.radio.amateur.homebrew,rec.radio.amateur.policy,rec.radio.amateur.space,rec.radio.cb,rec.radio.info,rec.answers,news.answers

```
Posted-By: auto-faq 3.2.1.2
Archive-name: radio/personal-intro
Revision: 1.5 12/18/93 14:15:53
Changes: new mailing lists, .packet rmgroup, and .policy updates

(Note: The following is reprinted with the permission of the author.)

This message describes the rec.radio.amateur.*, rec.radio.cb, rec.radio.info,
and rec.radio.swap newsgroups. It is intended to serve as a guide for the new
reader on what to find where. Questions and comments may be directed to the
author, Jay Maynard, K5ZC, by Internet electronic mail at
jmaynard@oac.hsc.uth.tmc.edu. This message was last changed on 18 September
1993 to add the mailing lists for the new rec.radio.amateur newsgroups, to
note the rmgroup of rec.radio.amateur.packet, and to officially retire some
(in)famous threads of discussion on rec.radio.amateur.policy.

History
=======

Way back when, before there was a Usenet, the Internet hosted a mailing list
for hams, called (appropriately enough) INFO-HAMS. Ham radio discussions
were held on the mailing list, and sent to the mailboxes of those who had
signed up for it. When the Usenet software was created, and net news as we
now know it was developed, a newsgroup was created for hams: net.ham-radio.
The mailing list and the newsgroup were gatewayed together, eventually.

As the net grew, and as packet radio came into vogue, packet discussion began
to dominate other topics in the group and on the list. This resulted in the
logical solution: a group was created to hold the packet discussion, and
another corresponding mailing list was created as well: net.ham-radio.packet
and PACKET-RADIO, respectively.

These two groups served for several years, and went through Usenet's Great
Renaming essentially unchanged, moving from net.ham-radio[.packet] to
rec.ham-radio[.packet]. Readership and volume grew with the rest of the
network.

The INFO-HAMS mailing list was originally run from a US Army computer at
White Sands Missile Range, SIMTEL20. There were few problems with this
arrangement, but one was that the system was not supposed to be used for
commercial purposes. Since one of hams' favorite pastimes is swapping
gear, it was natural for hams to post messages about equipment for sale
to INFO-HAMS/rec.ham-radio. This ran afoul of SIMTEL20's no-commercial-use
restriction, and after some argument, a group was created specifically
```

for messages like that: rec.ham-radio.swap. This group wasn't gatewayed to a mailing list, thus avoiding problems.

While all this was happening, other folks wanted to discuss other aspects of the world of radio than the personal communications services. Those folks created the rec.radio.shortwave and rec.radio.noncomm newsgroups, and established the precedent of the rec.radio.* hierarchy, which in turn reflected Usenet's overall trend toward a hierarchical name structure.

The debate between proponents of a no-code ham radio license and its opponents grew fierce and voluminous in late 1989 and 1990. Eventually, both sides grew weary of the debate, and those who had not been involved even more so. A proposal for a newsgroup dedicated to licensing issues failed. A later proposal was made for a group that would cover the many recurring legal issues discussions. During discussion of the latter proposal, it became clear that it would be desirable to fit the ham radio groups under the rec.radio.* hierarchy. A full-blown reorganization was passed by Usenet voters in January 1991, leading to the overall structure we now use.

After the reorganization, more and more regular information postings began to appear, and were spread out across the various groups in rec.radio.*. Taking the successful example of the news.answers group, where informational postings from across the net are sent, the group rec.radio.info was created in December, 1992, with Mark Salyzyn, VE6MGS, initially serving as moderator.

In January, 1993, many users started complaining about the volume in rec.radio.amateur.misc. This led to a discussion about a second reorganization, which sparked the creation of a mailing list by Ian Kluft, KD6EUI. This list, which was eventually joined by many of the most prolific posters to the ham radio groups, came up with a proposal to add 11 groups to the rec.radio.amateur hierarchy in April 1993. The subsequent vote, held in May and early June, approved the creation of five groups: rec.radio.amateur.digital.misc (to replace .packet), .equipment, .homebrew, .antenna, and .space.

The Current Groups

I can hear you asking, "OK, so this is all neat history, but what does it have to do with me now?" The answer is that the history of each group has a direct bearing on what the group is used for, and what's considered appropriate where.

The easy one is rec.radio.amateur.misc. It is what rec.ham-radio was renamed to during the reorganization. Any message that's not more appropriate in one of the other groups belongs here, from contesting to DX to ragchewing on VHF to information on becoming a ham.

The group rec.radio.amateur.digital.misc is for discussions related to (surprise!) digital amateur radio. This doesn't have to be the common two-meter AX.25 variety of packet radio, either; some of the most knowledgeable folks in radio digital communications can be found here, and anything in the general area is welcome. The name was changed to emphasize

this, and to encourage discussion not only of other text-based digital modes, such as AMTOR, RTTY, and Clover, but things like digital voice and video as well. The former group, rec.radio.amateur.packet, should be removed by September 21st, 1993. It is obsolete, and you should use .digital.misc instead (or the appropriate new mailing list, mentioned below). The group has .misc as part of the name to allow further specialization if the users wish it, such as .digital.tcp-ip.

The swap group is now rec.radio.swap. This recognizes a fact that became evident shortly after the original group was formed: Hams don't just swap ham radio gear, and other folks besides hams swap ham equipment. If you have radio equipment, or test gear, or computer stuff that hams would be interested in, here's the place. Equipment wanted postings belong here too. Discussions about the equipment generally don't; if you wish to discuss a particular posting with the buyer, email is a much better way to do it, and the other groups, especially .equipment and .homebrew, are the place for public discussions. There is now a regular posting with information on how to go about buying and selling items in rec.radio.swap; please refer to it before you post there.

The first reorganization added two groups to the list, one of which is rec.radio.amateur.policy. This group was created as a place for all the discussions that seem to drag on interminably about the many rules, regulations, legalities, and policies that surround amateur radio, both existing and proposed. Recent changes to the Amateur Radio Rules (FCC Part 97) have finally laid to rest the Great Usenet Pizza Autopatch Debate as well as complaints about now-preempted local scanner laws hostile to amateurs, but plenty of discussion about what a bunch of rotten no-goodniks the local frequency coordinating body is, as well as the neverending no-code debate, may still be found here.

The other added group is rec.radio.cb. This is the place for all discussion about the Citizens' Band radio service. Such discussions have been very inflammatory in rec.ham-radio in the past; please do not cross-post to both rec.radio.cb and rec.radio.amateur.* unless the topic is genuinely of interest to both hams and CBers - and very few topics are.

The rec.radio.info group is just what its name implies: it's the place where informational messages from across rec.radio.* may be found, regardless of where else they're posted. As of this writing, information posted to the group includes Cary Oler's daily solar progagation bulletins, ARRL bulletins, the Frequently Asked Questions files for the various groups, and radio modification instructions. This group is moderated, so you cannot post to it directly; if you try, even if your message is crossposted to one of the other groups, your message will be mailed to the moderator, who is currently Mark Salyzyn, VE6MGS. The email address for submissions to the group is rec-radio-info@ve6mgs.ampr.ab.ca. Inquires and other administrivia should be directed to rec-radio-request@ve6mgs.ampr.ab.ca. For more information about rec.radio.info, consult the introduction and posting guidelines that are regularly posted to that newsgroup.

The groups rec.radio.amateur.antenna, .equipment, .homebrew, and .space are for more specialized areas of ham radio: discussions about antennas,

commercially-made equipment, homebrewing, and amateur radio space operations. The .equipment group is not the place for buying or selling equipment; that's what rec.radio.swap is for. Similarly, the .space group is specifically about amateur radio in space, such as the OSCAR program and SAREX, the Shuttle Amateur Radio EXperiment; other groups cover other aspects of satellites and space. Homebrewing isn't about making your own alcoholic beverages at home (that's rec.crafts.brewing), but rather construction of radio and electronic equipment by the amateur experimenter.

Except for rec.radio.swap and rec.radio.cb, all of these newsgroups are available by Internet electronic mail in digest format; send a mail message containing "help" on a line by itself to listserv@ucsd.edu for instructions on how to use the mail server.

All of the groups can be posted to by electronic mail, though, by using a gateway at the University of Texas at Austin. To post a message this way, change the name of the group you wish to post to by replacing all of the '.'s with '-'s - for example, rec.radio.swap becomes rec-radio-swap - and send to that name@cs.utexas.edu (rec-radio-swap@cs.utexas.edu, for example). You may crosspost by including multiple addresses as Cc: entries (but see below). This gateway's continued availability is at the pleasure of the admins at UT-Austin, and is subject to going away at any time - and especially if forgeries and other net.abuses become a problem. You have been warned.

A Few Words on Crossposting
===========================

Please do not crosspost messages to two or more groups unless there is genuine interest in both groups in the topic being discussed, and when you do, please include a header line of the form "Followup-To: group.name" in your article's headers (before the first blank line). This will cause followups to your article to go to the group listed in the Followup-To: line. If you wish to have replies to go to you by email, rather than be posted, use the word "poster" instead of the name of a group. Such a line appears in the headers of this article.

One of the few examples of productive cross-posting is with the rec.radio.info newsgroup. To provide a filtered presentation of information articles, while still maintaining visibility in their home newsgroups, the moderator strongly encourages cross-posting. All information articles should be submitted to the rec.radio.info moderator so that he may simultaneously cross-post your information to the appropriate newsgroups. Most newsreaders will only present the article once, and network bandwidth is conserved since only one article is propagated. If you make regular informational postings, and have made arrangements with the moderator to post directly to the group, please cross-post as appropriate.

--
Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.
"If my car ran OS/2, it'd be there by now" -- bumper sticker
GCS d++ p+ c++ l+ m+/- s/++ g++ w++ t+ r

--
73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

1059. Re: Apollo 11 Anniversary

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 12:19:08 UTC
From: clj@ksr.com
Message-ID: <305urs$j8k@hopscotch.ksr.com>
Source record: 27358

In article <JMC.94Jul13233736@SAIL.Stanford.EDU>, jmc@SAIL (John McCarthy) writes:
>What a pity there is no moon base on the 20th anniversary of Apollo.

>He who refuses to do arithmetic is doomed to talk nonsense.

Oh, that pesky arithmetic.
--
Chris Jones clj@ksr.com

1060. SAREX Keps 7/15

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 13:28:41 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.010.1994@ampr.org>
Source record: 27206
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.010
SAREX Keps 7/15 at 13:30 UTC

Greenbelt, MD 7/15 at 13:30 UTC

At this time, the official SAREX Orbital element set for the STS-65 Space Shuttle Mission is set GSFC-023a with the NORAD drag values corrected by Gil Carman, WA5NOM. This set was generated by Ron Parise, WA4SIR at the Goddard Space Flight Center.

STS-65
1 23173U 94039A 94196.27214970 0.00067371 00000-0 20209-3 0 230
2 23173 28.4690 318.5489 0002791 13.8590 346.2097 15.90733062 1064

Satellite: STS-65
Catalog number: 23173
Epoch time: 94196.27214970 (15 JUL 94 06:31:53.74 UTC)
Element set: GSFC-023a
Inclination: 28.4690 deg
RA of node: 318.5489 deg Space Shuttle Flight STS-65
Eccentricity: 0.0002791 Keplerian Elements
Arg of perigee: 13.8590 deg
Mean anomaly: 346.2097 deg
Mean motion: 15.90733062 rev/day Semi-major Axis: 6678.3626 Km
Decay rate: 6.7371E-04 rev/day*2 Apogee Alt: 301.84 Km
Epoch rev: 106 Perigee Alt: 298.11 Km

NOTE - This element set is based on NORAD element set # 023.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1061. * SpaceNews 18-Jul-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 14:54:59 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0718.1994@ampr.org>
Source record: 27207
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info
Body handling: HTML body converted to readable text

SB NEWS @ AMSAT $SPC0718
* SpaceNews 18-Jul-94 *

BID: $SPC0718

=========
SpaceNews
=========

MONDAY JULY 18, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* STS-65 SAREX ACTIVITY *
========================
The Space Shuttle Columbia had a flawless liftoff on 08-Jul-94 at
16:43:00.083 UTC for a 14-day mission in space. Columbia has been assigned
Space Command Object Number 23173 and International Designator 1994-039 A.

The Shuttle Amateur Radio Experiment (SAREX) packet robot on board the
space shuttle Columbia was activated on 11-Jul-93. The following highly
edited text was copied on 12-Jul-94 at WA5ZIB from the STS-65 shuttle
mission:

W5RRR-1>QST [07/12/94 17:17:00] :
Hello from KC5HBV and KC5FVF aboard the Space Shuttle Columbia
We're well into our mission now conducting materials processing and
life sciences experiments that are paving the way for future operations
aboard our international space station. We've talked to schools in Texas,
Florida, Hawaii and Germany via SAREX and it's been great.

W5RRR-1>QRZ [07/12/94 17:17:57] :
#623-KE4HJV KE4HSB KJ5BM WD5IWT N5SEM XE2X KA5SFD KB5CXR KF7E KC6WYG WB6LLO
K6EXO WA5RTL KA7FNQ KE6BVF KD6BOG N6MZV KD6NEX N7QQ N6HL N6ZHV AA6SF AB6DG
WB6FJE W6US KD6VXJ W6NKF KJ9U ZS6BTD ZR3IE ZS1CM ZS6ADS N2QAC AD4HY WA4NRU

W5RRR-1>QSL [07/12/94 17:17:58] :
KB5CXR/717 PY3ADQ/662 PY3SS/647 JA1ZBM/642 7L2CAM/637 PU3VHQ/625 JA1NVB/617
JR5EBL/611 JM1QOP/588 JA2DXY/587 JF1AJE/584 JI7JRX/583 JA3CF/582 JS1MQG/580
TG9IKE/575

W5RRR-1>SAREX [07/12/94 17:17:59] :
This is STS-65 SAREX Robot station W5RRR-1
onboard the Space Shuttle Columbia.

[Info via WA5ZIB]

* GARC SHUTTLE RE-TRANSMISSIONS *
==========
The Goddard Amateur Radio Club (GARC) invites interested people to tune in to STS-65 shuttle ground communications transmissions. As a public service to the Amateur radio community, the GARC retransmits space shuttle air-to-ground communications. During the STS-65 mission which also carries a Shuttle Amateur Radio Experiment (SAREX), Amateur radio operators, shortwave listeners, and individuals with scanners can listen to these communications on the following HF (single sideband) and VHF (FM) frequencies:

3.860 MHz (LSB)
7.186 MHz (LSB)
14.295 MHz (USB)
21.395 MHz (USB)
28.650 MHz (USB)
147.450 MHz (FM) in local Washington D.C. metro area

[Info via Erich Franz Stocker, N3OXM]

* APOLLO ANNIVERSARY SPECIAL EVENTS *
==========
At least 12 amateur stations associated with the National Aeronautics and Space Administration will be active July 19 to 22 to commemorate the 25th anniversary of humans landing on the moon, on July 20, 1969, on Apollo 11. The operations will begin at 0700 UTC July 19 and end at 0500 UTC July 22, coinciding with the time the Apollo Moon Lander (the Eagle) was on the moon's surface in 1969.

Stations are expected to be on modes including CW, SSB, FM, packet, Pactor, Amtor, RTTY, SSTV, ATV, and amateur satellites. Here are the 12 stations expected to be active:

Ames Amateur Radio Club, NASA Ames Research Center, Moffett Field, California: K6MF (AARC, Box 73, Moffett Field CA 94035-1000).

Dryden Amateur Radio Club, NASA Dryden Flight Research Center, Edwards, California: KF7GD (NASA DFRC, Attn: Dryden ARC, POB 273, Edwards CA 93523).

Goddard Amateur Radio Club, NASA Goddard Space Flight Center, Greenbelt MD: WA3NAN (GARC, PO Box 86, Greenbelt, MD 20768-0086).

Guam Contingency Landing Site Amateur Radio Group: KC4YDP/KH2 (NASA RADIO, Kennedy Space Center FL 32899).

NASA Headquarters Amateur Radio Group, Washington, DC: N4ZR (2003 Sarazen Place, Reston VA 22091-3809).

Jet Propulsion Laboratory Amateur Radio Club and Goldstone Amateur Radio Club, Jet Propulsion Laboratory, Pasadena, California: W6VIO (JPLARC, M/S 168-327, 4800 Oak Grove Dr, Pasadena, CA 91109).

Johnson Space Center Amateur Radio Club, NASA Johnson Space Center, Houston, TX: W5RRR (JSC ARC/W5RRR, Johnson Space Center, Houston TX 77058).

Kennedy Space Center Amateur Radio Group, Kennedy Space Center, Florida: KC4TCV (NASA RADIO, Kennedy Space Center FL 32899).

NASA Lewis Amateur Radio Club (NLARC), NASA Lewis Research Center, Cleveland, Ohio: AK8Y (NASA Lewis Amateur Radio Club, 21000 Brookpark Rd, MS 54-6, Cleveland OH 44135).

Marshall Amateur Radio Club, NASA Marshall Space Flight Center, Huntsville, Alabama: WA4NZD (Marshall Amateur Radio Club, CM21X, MSFC AL 35812).

Stennis Space Center Amateur Radio Club, NASA Stennis Space Center, Mississippi: K5GY (Stennis Space Center Amateur Radio Club, Bldg 1201, Stennis Space Center MS 39529).

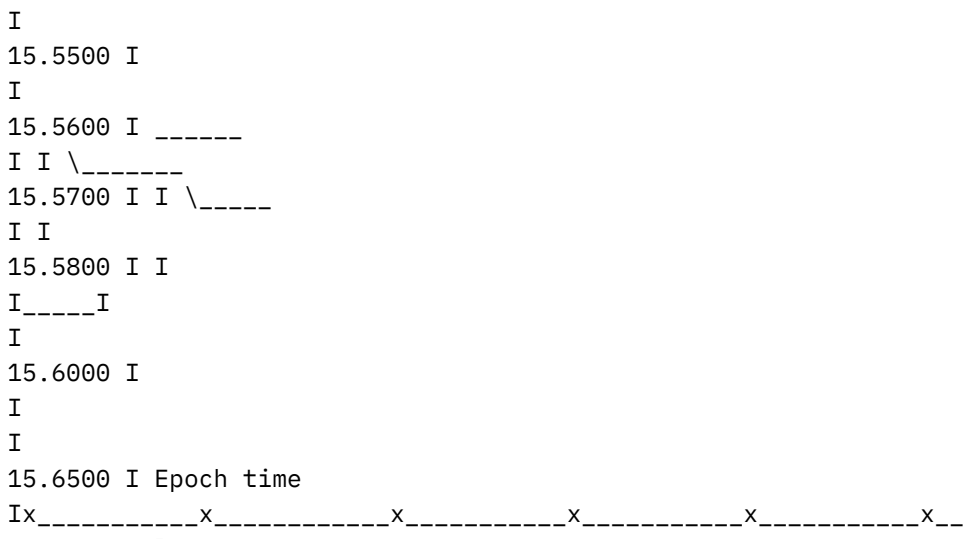
Wallops Island Amateur Radio Club, NASA Wallops Flight Facility, Wallops Island, Virginia: KE3ND (Wallops Island ARC, NASA Wallops Flight Facility, Building E-134, Wallops Island VA 23337).

White Sands Complex Amateur Radio Group, NASA White Sands Test Facility, Las Cruces, New Mexico: KF7E (P.O. Box 627, Organ NM 88052).

[Info via ARRL]

* MIR ORBIT ADJUSTMENTS *
==========
The following graphic depicts the mean motion (which is inversely proportional to mean orbital altitude) of Mir over the past several months:

TIME REVOLUTION (summary) for MIR Complex 16609
(Period= day 130 to day 185 1994)



Orbit adjustments were made on 12-March, 12-May, and on 03-July when Mir docked with the Soyuz TM-19 module.

[Info via Jean-Claude, FB1RCI]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

W9NQP Mark Butler Robert Morgan

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1062. orbs$196.oscar.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 15:24:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-196.o.1994@ampr.org>
Source record: 27211
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-196.O
Orbital Elements 196.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94176.41110075
Element set: 289
Inclination: 27.0856 deg
RA of node: 321.0039 deg
Eccentricity: 0.6024383
Arg of perigee: 189.2195 deg
Mean anomaly: 150.8337 deg
Mean motion: 2.05882336 rev/day
Decay rate: -3.06e-06 rev/day^2
Epoch rev: 8295
Checksum: 298

Satellite: UO-11
Catalog number: 14781
Epoch time: 94195.06242397
Element set: 707
Inclination: 97.7856 deg
RA of node: 208.5283 deg
Eccentricity: 0.0011425
Arg of perigee: 178.8317 deg
Mean anomaly: 181.2912 deg
Mean motion: 14.69229240 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 55425
Checksum: 322

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94191.83829016
Element set: 925
Inclination: 82.9253 deg
RA of node: 311.3579 deg
Eccentricity: 0.0011286
Arg of perigee: 326.8723 deg
```

Mean anomaly: 33.1722 deg
Mean motion: 13.72339043 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 35315
Checksum: 294

Satellite: AO-13
Catalog number: 19216
Epoch time: 94194.95255508
Element set: 929
Inclination: 57.7505 deg
RA of node: 242.1137 deg
Eccentricity: 0.7218612
Arg of perigee: 345.7422 deg
Mean anomaly: 1.7891 deg
Mean motion: 2.09718797 rev/day
Decay rate: 2.98e-06 rev/day^2
Epoch rev: 4657
Checksum: 339

Satellite: FO-20
Catalog number: 20480
Epoch time: 94189.41964946
Element set: 704
Inclination: 99.0382 deg
RA of node: 337.2291 deg
Eccentricity: 0.0540391
Arg of perigee: 291.4400 deg
Mean anomaly: 62.9899 deg
Mean motion: 12.83226051 rev/day
Decay rate: -3.1e-07 rev/day^2
Epoch rev: 20685
Checksum: 311

Satellite: AO-21
Catalog number: 21087
Epoch time: 94194.16588839
Element set: 488
Inclination: 82.9469 deg
RA of node: 123.4935 deg
Eccentricity: 0.0036545
Arg of perigee: 13.7087 deg
Mean anomaly: 346.5049 deg
Mean motion: 13.74542040 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 17315
Checksum: 332

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94194.88952093

Element set: 707
Inclination: 82.9198 deg
RA of node: 351.6397 deg
Eccentricity: 0.0030785
Arg of perigee: 35.6257 deg
Mean anomaly: 324.6938 deg
Mean motion: 13.74043526 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 17231
Checksum: 338

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94188.21304092
Element set: 264
Inclination: 1.8958 deg
RA of node: 98.1428 deg
Eccentricity: 0.2918247
Arg of perigee: 185.7752 deg
Mean anomaly: 169.5951 deg
Mean motion: 1.42202950 rev/day
Decay rate: -1.16e-06 rev/day^2
Epoch rev: 148
Checksum: 305

/EX

1063. orbs$196.micro.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 15:26:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-196.d.1994@ampr.org>
Source record: 27199
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-196.D
Orbital Elements 196.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94194.18674123
Element set: 9
Inclination: 98.5896 deg
RA of node: 278.6106 deg
Eccentricity: 0.0011733
Arg of perigee: 112.1063 deg
Mean anomaly: 248.1368 deg
Mean motion: 14.29849139 rev/day
Decay rate: 6.0e-08 rev/day^2
Epoch rev: 23330
Checksum: 304

Satellite: AO-16
Catalog number: 20439
Epoch time: 94191.23243034
Element set: 807
Inclination: 98.5970 deg
RA of node: 276.9521 deg
Eccentricity: 0.0011864
Arg of perigee: 120.8244 deg
Mean anomaly: 239.4105 deg
Mean motion: 14.29902905 rev/day
Decay rate: 2.0e-08 rev/day^2
Epoch rev: 23289
Checksum: 299

Satellite: DO-17
Catalog number: 20440
Epoch time: 94191.18451979
Element set: 807
Inclination: 98.5982 deg
RA of node: 277.2360 deg
Eccentricity: 0.0011890
Arg of perigee: 119.6518 deg
```

Mean anomaly: 240.5849 deg
Mean motion: 14.30042562 rev/day
Decay rate: 8.0e-08 rev/day^2
Epoch rev: 23290
Checksum: 314

Satellite: WO-18
Catalog number: 20441
Epoch time: 94193.67915633
Element set: 810
Inclination: 98.5990 deg
RA of node: 279.7005 deg
Eccentricity: 0.0012641
Arg of perigee: 113.6115 deg
Mean anomaly: 246.6399 deg
Mean motion: 14.30016962 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 23326
Checksum: 299

Satellite: LO-19
Catalog number: 20442
Epoch time: 94192.18636356
Element set: 806
Inclination: 98.5997 deg
RA of node: 278.4886 deg
Eccentricity: 0.0012869
Arg of perigee: 117.3153 deg
Mean anomaly: 242.9341 deg
Mean motion: 14.30113219 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 23306
Checksum: 313

Satellite: UO-22
Catalog number: 21575
Epoch time: 94194.66619103
Element set: 511
Inclination: 98.4338 deg
RA of node: 268.6283 deg
Eccentricity: 0.0007042
Arg of perigee: 206.6952 deg
Mean anomaly: 153.3878 deg
Mean motion: 14.36923444 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 15688
Checksum: 326

Satellite: KO-23
Catalog number: 22077
Epoch time: 94194.13082891

Element set: 406
Inclination: 66.0832 deg
RA of node: 225.6621 deg
Eccentricity: 0.0015044
Arg of perigee: 281.6382 deg
Mean anomaly: 78.2949 deg
Mean motion: 12.86286951 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9012
Checksum: 306

Satellite: AO-27
Catalog number: 22825
Epoch time: 94193.74755536
Element set: 304
Inclination: 98.6530 deg
RA of node: 269.3004 deg
Eccentricity: 0.0009155
Arg of perigee: 129.4928 deg
Mean anomaly: 230.7062 deg
Mean motion: 14.27628830 rev/day
Decay rate: 4.0e-08 rev/day^2
Epoch rev: 4133
Checksum: 301

Satellite: IO-26
Catalog number: 22826
Epoch time: 94192.74556263
Element set: 304
Inclination: 98.6522 deg
RA of node: 268.3468 deg
Eccentricity: 0.0009568
Arg of perigee: 134.0785 deg
Mean anomaly: 226.1185 deg
Mean motion: 14.27733130 rev/day
Decay rate: 3.0e-08 rev/day^2
Epoch rev: 4119
Checksum: 309

Satellite: KO-25
Catalog number: 22830
Epoch time: 94193.17093563
Element set: 309
Inclination: 98.5531 deg
RA of node: 265.7524 deg
Eccentricity: 0.0012396
Arg of perigee: 101.6312 deg
Mean anomaly: 258.6268 deg
Mean motion: 14.28059498 rev/day
Decay rate: -1.0e-07 rev/day^2
Epoch rev: 4126

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Checksum: 304

/EX
```

1064. orbs$196.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 15:27:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-196.w.1994@ampr.org>
Source record: 27210
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-196.W
Orbital Elements 196.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94194.99686475
Element set: 874
Inclination: 99.0473 deg
RA of node: 245.7977 deg
Eccentricity: 0.0015281
Arg of perigee: 141.2505 deg
Mean anomaly: 218.9765 deg
Mean motion: 14.13628436 rev/day
Decay rate: 8.4e-07 rev/day^2
Epoch rev: 49404
Checksum: 356

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94194.98167710
Element set: 771
Inclination: 98.5052 deg
RA of node: 203.1638 deg
Eccentricity: 0.0012179
Arg of perigee: 251.8027 deg
Mean anomaly: 108.1826 deg
Mean motion: 14.24897266 rev/day
Decay rate: 8.1e-07 rev/day^2
Epoch rev: 40631
Checksum: 319

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94194.54056114
Element set: 335
Inclination: 82.5412 deg
RA of node: 247.6202 deg
Eccentricity: 0.0018062
Arg of perigee: 103.4929 deg
```

Mean anomaly: 256.8248 deg
Mean motion: 13.84718542 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 32600
Checksum: 290

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94194.22136815
Element set: 302
Inclination: 82.5413 deg
RA of node: 305.2575 deg
Eccentricity: 0.0016030
Arg of perigee: 195.4260 deg
Mean anomaly: 164.6376 deg
Mean motion: 13.16967780 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28668
Checksum: 302

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94194.97891555
Element set: 692
Inclination: 99.1747 deg
RA of node: 184.5475 deg
Eccentricity: 0.0012899
Arg of perigee: 57.3264 deg
Mean anomaly: 302.9149 deg
Mean motion: 14.13002039 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 29892
Checksum: 345

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94191.85639551
Element set: 302
Inclination: 82.5208 deg
RA of node: 125.0543 deg
Eccentricity: 0.0013991
Arg of perigee: 153.7603 deg
Mean anomaly: 206.4260 deg
Mean motion: 13.84367799 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 27096
Checksum: 322

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94194.92403808

Element set: 89
Inclination: 82.5560 deg
RA of node: 251.5016 deg
Eccentricity: 0.0007665
Arg of perigee: 212.6308 deg
Mean anomaly: 147.4475 deg
Mean motion: 13.04409832 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22638
Checksum: 292

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94193.02564718
Element set: 807
Inclination: 82.5382 deg
RA of node: 188.7333 deg
Eccentricity: 0.0017853
Arg of perigee: 77.2924 deg
Mean anomaly: 283.0207 deg
Mean motion: 13.84189830 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 20405
Checksum: 309

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94194.03417053
Element set: 13
Inclination: 98.8356 deg
RA of node: 213.3492 deg
Eccentricity: 0.0015573
Arg of perigee: 302.7604 deg
Mean anomaly: 57.2060 deg
Mean motion: 14.01356654 rev/day
Decay rate: -8.2e-07 rev/day^2
Epoch rev: 19732
Checksum: 287

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94192.24637361
Element set: 815
Inclination: 82.5260 deg
RA of node: 126.8437 deg
Eccentricity: 0.0013852
Arg of perigee: 348.2605 deg
Mean anomaly: 11.8236 deg
Mean motion: 13.83584780 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 19108

Checksum: 303

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94192.41447599
Element set: 714
Inclination: 82.5397 deg
RA of node: 152.4638 deg
Eccentricity: 0.0013853
Arg of perigee: 120.2656 deg
Mean anomaly: 239.9835 deg
Mean motion: 13.16463320 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15454
Checksum: 306

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94194.99451251
Element set: 96
Inclination: 98.6161 deg
RA of node: 222.1803 deg
Eccentricity: 0.0013093
Arg of perigee: 154.5532 deg
Mean anomaly: 205.6291 deg
Mean motion: 14.22428011 rev/day
Decay rate: 1.61e-06 rev/day^2
Epoch rev: 16431
Checksum: 268

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94194.19428742
Element set: 723
Inclination: 82.5532 deg
RA of node: 98.3833 deg
Eccentricity: 0.0013766
Arg of perigee: 126.6238 deg
Mean anomaly: 233.6140 deg
Mean motion: 13.16831903 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13988
Checksum: 313

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94194.41246650
Element set: 315
Inclination: 82.5469 deg
RA of node: 185.6515 deg
Eccentricity: 0.0023001

```
Arg of perigee: 148.4453 deg
Mean anomaly: 211.8095 deg
Mean motion: 13.83010359 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 4371
Checksum: 285

/EX
```

1065. orbs$196.misc.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 15:28:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-196.m.1994@ampr.org>
Source record: 27209
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-196.M
Orbital Elements 196.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94193.24660920
Element set: 297
Inclination: 98.6491 deg
RA of node: 268.8716 deg
Eccentricity: 0.0010740
Arg of perigee: 120.3722 deg
Mean anomaly: 239.8519 deg
Mean motion: 14.28032813 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 4127
Checksum: 297

Satellite: MIR
Catalog number: 16609
Epoch time: 94194.90801470
Element set: 679
Inclination: 51.6459 deg
RA of node: 52.7244 deg
Eccentricity: 0.0003477
Arg of perigee: 143.6748 deg
Mean anomaly: 216.4466 deg
Mean motion: 15.56583481 rev/day
Decay rate: 6.924e-05 rev/day^2
Epoch rev: 48018
Checksum: 333

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94192.85852801
Element set: 505
Inclination: 28.4692 deg
RA of node: 77.4963 deg
Eccentricity: 0.0006071
Arg of perigee: 346.8534 deg
```

Mean anomaly: 13.1893 deg
Mean motion: 14.90638114 rev/day
Decay rate: 4.26e-06 rev/day^2
Epoch rev: 3307
Checksum: 297

Satellite: GRO
Catalog number: 21225
Epoch time: 94190.87753482
Element set: 114
Inclination: 28.4619 deg
RA of node: 74.6101 deg
Eccentricity: 0.0003465
Arg of perigee: 117.4235 deg
Mean anomaly: 242.6711 deg
Mean motion: 15.41023364 rev/day
Decay rate: 2.166e-05 rev/day^2
Epoch rev: 6044
Checksum: 264

Satellite: UARS
Catalog number: 21701
Epoch time: 94192.89558286
Element set: 554
Inclination: 56.9857 deg
RA of node: 60.0520 deg
Eccentricity: 0.0005570
Arg of perigee: 103.1912 deg
Mean anomaly: 256.9743 deg
Mean motion: 14.96455115 rev/day
Decay rate: 3.368e-05 rev/day^2
Epoch rev: 15463
Checksum: 312

/EX

1066. orbs$196.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 15:29:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-196.n.1994@ampr.org>
Source record: 27204
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-196.N
2Line Orbital Elements 196.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94176.41110075 -.00000306 00000-0 10000-3 0 2893
2 14129 27.0856 321.0039 6024383 189.2195 150.8337 2.05882336 82954
UO-11
1 14781U 84021B 94195.06242397 .00000083 00000-0 21899-4 0 7078
2 14781 97.7856 208.5283 0011425 178.8317 181.2912 14.69229240554255
RS-10/11
1 18129U 87054A 94191.83829016 .00000023 00000-0 90572-5 0 9258
2 18129 82.9253 311.3579 0011286 326.8723 33.1722 13.72339043353150
AO-13
1 19216U 88051B 94194.95255508 .00000298 00000-0 10000-4 0 9294
2 19216 57.7505 242.1137 7218612 345.7422 1.7891 2.09718797 46572
FO-20
1 20480U 90013C 94189.41964946 -.00000031 00000-0 10578-4 0 7045
2 20480 99.0382 337.2291 0540391 291.4400 62.9899 12.83226051206850
AO-21
1 21087U 91006A 94194.16588839 .00000094 00000-0 82657-4 0 4887
2 21087 82.9469 123.4935 0036545 13.7087 346.5049 13.74542040173152
RS-12/13
1 21089U 91007A 94194.88952093 .00000027 00000-0 12522-4 0 7070
2 21089 82.9198 351.6397 0030785 35.6257 324.6938 13.74043526172318
ARSENE
1 22654U 93031B 94188.21304092 -.00000116 00000-0 00000 0 0 2649
2 22654 1.8958 98.1428 2918247 185.7752 169.5951 1.42202950 1486
UO-14
1 20437U 90005B 94194.18674123 .00000006 00000-0 19106-4 0 98
2 20437 98.5896 278.6106 0011733 112.1063 248.1368 14.29849139233305
AO-16
1 20439U 90005D 94191.23243034 .00000002 00000-0 17803-4 0 8070
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2 20439 98.5970 276.9521 0011864 120.8244 239.4105 14.29902905232890
DO-17
1 20440U 90005E 94191.18451979 .00000008 00000-0 19944-4 0 8079
2 20440 98.5982 277.2360 0011890 119.6518 240.5849 14.30042562232905
WO-18
1 20441U 90005F 94193.67915633 .00000013 00000-0 21986-4 0 8107
2 20441 98.5990 279.7005 0012641 113.6115 246.6399 14.30016962233262
LO-19
1 20442U 90005G 94192.18636356 .00000011 00000-0 20960-4 0 8069
2 20442 98.5997 278.4886 0012869 117.3153 242.9341 14.30113219233065
UO-22
1 21575U 91050B 94194.66619103 .00000045 00000-0 29726-4 0 5113
2 21575 98.4338 268.6283 0007042 206.6952 153.3878 14.36923444156888
KO-23
1 22077U 92052B 94194.13082891 -.00000037 00000-0 10000-3 0 4063
2 22077 66.0832 225.6621 0015044 281.6382 78.2949 12.86286951 90122
AO-27
1 22825U 93061C 94193.74755536 .00000004 00000-0 19606-4 0 3046
2 22825 98.6530 269.3004 0009155 129.4928 230.7062 14.27628830 41333
IO-26
1 22826U 93061D 94192.74556263 .00000003 00000-0 18991-4 0 3047
2 22826 98.6522 268.3468 0009568 134.0785 226.1185 14.27733130 41198
KO-25
1 22830U 93061H 94193.17093563 -.00000010 00000-0 13333-4 0 3098
2 22830 98.5531 265.7524 0012396 101.6312 258.6268 14.28059498 41264
NOAA-9
1 15427U 84123A 94194.99686475 .00000084 00000-0 68552-4 0 8742
2 15427 99.0473 245.7977 0015281 141.2505 218.9765 14.13628436494046
NOAA-10
1 16969U 86073A 94194.98167710 .00000081 00000-0 53006-4 0 7716
2 16969 98.5052 203.1638 0012179 251.8027 108.1826 14.24897266406319
MET-2/17
1 18820U 88005A 94194.54056114 .00000052 00000-0 32691-4 0 3359
2 18820 82.5412 247.6202 0018062 103.4929 256.8248 13.84718542326000
MET-3/2
1 19336U 88064A 94194.22136815 .00000051 00000-0 10000-3 0 3021
2 19336 82.5413 305.2575 0016030 195.4260 164.6376 13.16967780286682
NOAA-11
1 19531U 88089A 94194.97891555 .00000075 00000-0 65024-4 0 6921
2 19531 99.1747 184.5475 0012899 57.3264 302.9149 14.13002039298929
MET-2/18
1 19851U 89018A 94191.85639551 .00000047 00000-0 29128-4 0 3021
2 19851 82.5208 125.0543 0013991 153.7603 206.4260 13.84367799270960
MET-3/3
1 20305U 89086A 94194.92403808 .00000044 00000-0 10000-3 0 894
2 20305 82.5560 251.5016 0007665 212.6308 147.4475 13.04409832226381
MET-2/19
1 20670U 90057A 94193.02564718 .00000030 00000-0 13553-4 0 8077
2 20670 82.5382 188.7333 0017853 77.2924 283.0207 13.84189830204051
FY-1/2
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1 20788U 90081A 94194.03417053 -.00000082 00000-0 -26181-4 0 134
2 20788 98.8356 213.3492 0015573 302.7604 57.2060 14.01356654197320
MET-2/20
1 20826U 90086A 94192.24637361 .00000056 00000-0 37102-4 0 8153
2 20826 82.5260 126.8437 0013852 348.2605 11.8236 13.83584780191088
MET-3/4
1 21232U 91030A 94192.41447599 .00000051 00000-0 10000-3 0 7146
2 21232 82.5397 152.4638 0013853 120.2656 239.9835 13.16463320154544
NOAA-12
1 21263U 91032A 94194.99451251 .00000161 00000-0 91625-4 0 965
2 21263 98.6161 222.1803 0013093 154.5532 205.6291 14.22428011164311
MET-3/5
1 21655U 91056A 94194.19428742 .00000051 00000-0 10000-3 0 7239
2 21655 82.5532 98.3833 0013766 126.6238 233.6140 13.16831903139884
MET-2/21
1 22782U 93055A 94194.41246650 .00000037 00000-0 19902-4 0 3155
2 22782 82.5469 185.6515 0023001 148.4453 211.8095 13.83010359 43717
POSAT
1 22829U 93061G 94193.24660920 .00000013 00000-0 22747-4 0 2978
2 22829 98.6491 268.8716 0010740 120.3722 239.8519 14.28032813 41272
MIR
1 16609U 86017A 94194.90801470 .00006924 00000-0 10228-3 0 6792
2 16609 51.6459 52.7244 0003477 143.6748 216.4466 15.56583481480188
HUBBLE
1 20580U 90037B 94192.85852801 .00000426 00000-0 27230-4 0 5059
2 20580 28.4692 77.4963 0006071 346.8534 13.1893 14.90638114 33076
GRO
1 21225U 91027B 94190.87753482 .00002166 00000-0 44839-4 0 1144
2 21225 28.4619 74.6101 0003465 117.4235 242.6711 15.41023364 60440
UARS
1 21701U 91063B 94192.89558286 .00003368 00000-0 31530-3 0 5548
2 21701 56.9857 60.0520 0005570 103.1912 256.9743 14.96455115154636
/EX
```

1067. Two-Line Orbital Element Sets (TLE431)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 19:10:00 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774299400@afit.af.mil>
Source record: 27360

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #431 -
Alouette 1
1 00424U 62049 94193.65596836 .00000028 00000-0 22646-4 0 91
2 00424 80.4644 259.8733 0024208 51.7549 308.5774 13.67814235585880
ATS 1
1 02608U 66110A 94194.62407436 -.00000308 00000-0 10000-3 0 8860
2 02608 14.5766 0.2508 0009770 49.4630 44.5156 1.00368756 17730
ATS 3
1 03029U 67111A 94191.38600387 -.00000113 00000-0 10000-3 0 2172
2 03029 14.6674 7.2470 0009336 266.8391 47.7326 1.00273276 97665
Cosmos 398
1 04966U 71016A 94196.16789906 .00085315 76600-5 16376-3 0 3632
2 04966 51.4352 219.5498 1002166 87.3836 284.2082 13.94135570776640
Starlette
1 07646U 75010A 94193.89090045 -.00000154 00000-0 -69096-5 0 7969
2 07646 49.8247 51.9253 0205821 61.0974 301.0396 13.82186333981401
LAGEOS
1 08820U 76039A 94194.41278262 .00000008 00000-0 10000-3 0 108
2 08820 109.8195 144.5808 0044345 279.4589 80.0976 6.38664361168825
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94192.26169793 .00000076 00000-0 00000+0 0 3695
2 10061 11.2439 45.4188 0001728 0.5756 200.7697 1.00275861 7357
IUE
1 10637U 78012A 94190.15817843 -.00000255 00000-0 10000-3 0 151
2 10637 34.6334 94.5219 1316059 36.5519 163.0650 1.00260630 12941
GPS BI-01
1 10684U 78020A 94191.45987076 -.00000007 00000-0 10000-3 0 2812
2 10684 64.6591 44.8137 0062666 164.2443 196.0398 1.98070022105392
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GPS BI-02
1 10893U 78047A 94189.57993342 -.00000016 00000-0 10000-3 0 791
2 10893 63.5726 283.7669 0214915 13.3703 347.2407 2.01628055118503
GOES 3
1 10953U 78062A 94191.58683859 .00000062 00000-0 10000-3 0 3285
2 10953 10.1755 48.1926 0005866 66.8260 209.1381 1.00249014 11953
SeaSat 1
1 10967U 78064A 94194.90240667 -.00000014 00000-0 39837-4 0 3050
2 10967 108.0006 157.4974 0002574 251.2524 108.8339 14.37966374840202
GPS BI-03
1 11054U 78093A 94192.53598418 -.00000006 00000-0 10000-3 0 1955
2 11054 63.2253 281.0345 0044753 176.2815 183.8189 1.93504548114980
Nimbus 7
1 11080U 78098A 94194.70377905 -.00000074 00000-0 -28284-4 0 4094
2 11080 99.0496 77.3410 0009787 61.7684 298.4457 13.83729888793740
GPS BI-04
1 11141U 78112A 94192.72693284 -.00000011 00000-0 00000+0 0 8949
2 11141 64.6846 46.0566 0048666 26.0038 334.3157 1.92895030 4254
GPS BI-05
1 11690U 80011A 94193.83975273 -.00000014 00000-0 10000-3 0 8053
2 11690 65.0423 46.5247 0142204 197.3733 162.2022 2.00557221120050
GPS BI-06
1 11783U 80032A 94190.11380622 -.00000002 00000-0 10000-3 0 9840
2 11783 62.6395 277.4849 0210478 29.3114 331.9220 2.03456668104405
GOES 5
1 12472U 81049A 94191.52863918 .00000028 00000-0 10000-3 0 7750
2 12472 6.8774 57.8268 0007427 10.4029 284.0319 1.00327499 5997
Cosmos 1383
1 13301U 82066A 94193.26337893 -.00000003 00000-0 -21259-4 0 3078
2 13301 82.9314 291.3674 0028769 27.9276 332.3408 13.68056341600853
LandSat 4
1 13367U 82072A 94193.19471600 .00000039 00000-0 18654-4 0 5078
2 13367 98.1791 251.2849 0006693 168.6433 191.4918 14.57133830637704
IRAS
1 13777U 83004A 94195.51730577 -.00000083 00000-0 -27160-4 0 6487
2 13777 98.9687 25.8997 0012217 236.4417 123.5588 13.99200666254964
Cosmos 1447
1 13916U 83021A 94192.94841232 .00000026 00000-0 12303-4 0 4088
2 13916 82.9419 353.3782 0037673 322.8098 37.0448 13.74312180566737
TDRS 1
1 13969U 83026B 94193.71912659 -.00000197 00000-0 10000-4 0 3169
2 13969 7.7515 50.8369 0006358 68.4207 155.3061 1.00274703 14308
GOES 6
1 14050U 83041A 94191.28363438 -.00000004 00000-0 10000-3 0 2337
2 14050 5.6684 60.8571 0004673 342.0617 228.8013 1.00223059 13012
OSCAR 10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 55387
LandSat 5
1 14780U 84021A 94193.57568173 .00000043 00000-0 19605-4 0 952
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2 14780 98.1630 252.8344 0004420 169.6402 190.4890 14.57139994551177
UoSat 2
1 14781U 84021B 94195.06242397 .00000083 00000-0 21899-4 0 7078
2 14781 97.7856 208.5283 0011425 178.8317 181.2912 14.69229240554255
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94193.56642256 .00000048 00000-0 34644-4 0 6071
2 15055 82.9552 46.3355 0027839 142.8008 217.5083 13.73608194504116
GPS BI-10
1 15271U 84097A 94196.06431653 -.00000021 00000-0 10000-3 0 8213
2 15271 62.3469 277.3784 0147014 349.1124 10.6485 2.00583298 71163
Cosmos 1602
1 15331U 84105A 94195.06821160 .00000273 00000-0 29463-4 0 2996
2 15331 82.5323 52.5583 0021474 110.7459 249.6056 14.84430023528502
NOAA 9
1 15427U 84123A 94195.77543642 .00000096 00000-0 74775-4 0 8755
2 15427 99.0476 246.5851 0015396 139.0125 221.2202 14.13628779494154
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94195.87104505 .00002463 00000-0 40816-4 0 6818
2 16609 51.6466 47.9107 0002406 137.5799 222.5380 15.56566564480332
SPOT 1
1 16613U 86019A 94194.77440623 .00000089 00000-0 62356-4 0 6991
2 16613 98.6857 267.9286 0002087 8.4070 351.7143 14.20051968120337
Cosmos 1766
1 16881U 86055A 94192.23949229 .00000257 00000-0 28287-4 0 2148
2 16881 82.5196 113.2039 0019637 142.5307 217.7279 14.83456849429028
EGP
1 16908U 86061A 94194.90265720 -.00000097 00000-0 00000+0 0 9045
2 16908 50.0121 2.2657 0011466 21.8602 338.2720 12.44410034 28710
NOAA 10
1 16969U 86073A 94195.89454402 .00000082 00000-0 53201-4 0 7723
2 16969 98.5055 204.0486 0012162 249.0010 110.9884 14.24897499406443
MOS-1
1 17527U 87018A 94194.81055826 .00000091 00000-0 99794-4 0 935
2 17527 99.0301 262.9406 0000956 2.9266 357.1899 13.94910415376656
GOES 7
1 17561U 87022A 94194.47782833 -.00000044 00000-0 10000-3 0 9193
2 17561 1.6068 75.4135 0004628 353.2467 281.8922 1.00269172 10234
Kvant-1
1 17845U 87030A 94195.10064799 .00001337 00000-0 25292-4 0 9108
2 17845 51.6473 51.7703 0002357 126.0563 234.1631 15.56559228480309
DMSP B5D2-3
1 18123U 87053A 94195.86410690 .00000015 00000-0 30097-4 0 5603
2 18123 98.7850 27.1548 0014937 99.7258 260.5598 14.15364470365009
RS-10/11
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1 18129U 87054A 94191.83829016 .00000023 00000-0 90572-5 0 9258
2 18129 82.9253 311.3579 0011286 326.8723 33.1722 13.72339043353150
Meteor 2-16
1 18312U 87068A 94195.91874017 .00000048 00000-0 30091-4 0 3059
2 18312 82.5530 189.8597 0013938 38.7115 321.5044 13.84033959348892
Meteor 2-17
1 18820U 88005A 94195.62442481 .00000054 00000-0 34813-4 0 3366
2 18820 82.5411 246.7577 0018072 100.6753 259.6442 13.84718636326156
DMSP B5D2-4
1 18822U 88006A 94195.83752728 .00000022 00000-0 28216-4 0 6683
2 18822 98.4370 49.6540 0005466 270.6750 89.3819 14.22958756334535
Glonass 34
1 19163U 88043A 94192.82147357 .00000023 00000-0 10000-3 0 9039
2 19163 65.0362 109.6228 0006823 157.8596 202.1912 2.13102331 47185
Glonass 36
1 19165U 88043C 94189.12320139 -.00000003 00000-0 10000-3 0 2965
2 19165 65.0178 109.7064 0003784 322.7212 37.2602 2.13102235 47728
METEOSAT 3
1 19215U 88051A 94194.48662753 -.00000253 00000-0 10000-3 0 9432
2 19215 1.7897 72.0639 0001499 57.3335 261.9798 1.00259488 10176
AO-13
1 19216U 88051B 94195.90619677 .00000281 00000-0 10000-4 0 9305
2 19216 57.7690 241.9596 7219247 345.7696 1.7723 2.09719219 15098
OKEAN 1
1 19274U 88056A 94196.15313993 .00000147 00000-0 15442-4 0 9153
2 19274 82.5127 209.4936 0018308 281.3977 78.5177 14.82193775325226
Meteor 3-2
1 19336U 88064A 94194.22136815 .00000051 00000-0 10000-3 0 3021
2 19336 82.5413 305.2575 0016030 195.4260 164.6376 13.16967780286682
Glonass 39
1 19503U 88085C 94193.37270319 -.00000036 00000-0 10000-3 0 1980
2 19503 65.7476 348.4886 0005650 167.6449 192.3925 2.13102065 45302
NOAA 11
1 19531U 88089A 94195.89945113 .00000038 00000-0 45187-4 0 6931
2 19531 99.1772 185.4934 0012944 55.9789 304.2619 14.13001741299055
TDRS 2
1 19548U 88091B 94193.45213029 .00000114 00000-0 10000-3 0 9625
2 19548 1.0664 77.2492 0002535 111.7678 111.5683 0.99830589 8456
Glonass 40
1 19749U 89001A 94191.06566881 .00000014 00000-0 10000-3 0 4053
2 19749 64.9816 109.2521 0006740 262.4684 97.4843 2.13101483 42762
Glonass 41
1 19750U 89001B 94191.12200851 .00000015 00000-0 10000-3 0 3043
2 19750 65.0004 109.3019 0006316 257.7063 102.2174 2.13101937 42783
GPS BII-01
1 19802U 89013A 94194.15252813 .00000044 00000-0 10000-3 0 9201
2 19802 55.1120 138.6843 0030622 179.8556 180.1444 2.00553406 39574
Akebono
1 19822U 89016A 94191.31191070 .00000063 00000-0 51177-5 0 2899
2 19822 75.0936 169.4839 3817274 273.9069 44.4193 7.78443430111099
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Meteor 2-18
1 19851U 89018A 94196.19295176 .00000038 00000-0 20582-4 0 3030
2 19851 82.5215 121.5989 0014411 141.6027 218.6165 13.84367909271566
MOP-1
1 19876U 89020B 94195.43116255 -.00000072 00000-0 00000+0 0 401
2 19876 0.5068 65.8228 0002103 59.4607 313.7873 1.00272318 433
TDRS 3
1 19883U 89021B 94193.39868277 -.00000266 00000-0 00000+0 0 9506
2 19883 0.0202 209.5901 0004511 113.7454 69.2397 1.00268050192120
GPS BII-02
1 20061U 89044A 94194.49518991 -.00000060 00000-0 10000-3 0 9381
2 20061 54.6462 315.3711 0133048 208.4012 150.8927 2.00564997 37324
Nadezhda 1
1 20103U 89050A 94195.82955892 .00000016 00000-0 54941-6 0 441
2 20103 82.9584 267.3673 0036603 211.2487 148.6493 13.73840868252104
GPS BII-03
1 20185U 89064A 94194.82876785 .00000044 00000-0 00000+0 0 9347
2 20185 54.9416 139.2534 0010411 272.8480 87.0176 2.00569366 35905
GMS 4
1 20217U 89070A 94195.62354939 -.00000288 00000-0 10000-3 0 405
2 20217 0.3115 71.4863 0000912 52.7176 172.3498 1.00261659 18365
GPS BII-04
1 20302U 89085A 94194.86368809 .00000010 00000-0 00000+0 0 9419
2 20302 53.5652 255.6302 0004573 239.4619 120.6179 2.00565447 34704
Meteor 3-3
1 20305U 89086A 94195.92116804 .00000044 00000-0 10000-3 0 904
2 20305 82.5525 250.8015 0006415 216.7507 143.3318 13.04413405226518
COBE
1 20322U 89089A 94192.51508766 -.00000046 00000-0 -10970-5 0 250
2 20322 98.9755 208.3418 0008447 198.8529 161.2323 14.03441344237801
Kvant-2
1 20335U 89093A 94195.10064799 .00001337 00000-0 25292-4 0 9736
2 20335 51.6473 51.7703 0002357 126.0563 234.1631 15.56559228480228
GPS BII-05
1 20361U 89097A 94195.87114139 -.00000031 00000-0 10000-3 0 8153
2 20361 55.5449 81.1882 0073995 110.3959 250.4550 2.00561048 24200
SPOT 2
1 20436U 90005A 94196.22453991 .00000095 00000-0 65161-4 0 8146
2 20436 98.7136 270.2369 0001116 32.7220 327.4006 14.20033060232070
UO-14
1 20437U 90005B 94194.18674123 .00000006 00000-0 19106-4 0 98
2 20437 98.5896 278.6106 0011733 112.1063 248.1368 14.29849139233305
UO-15
1 20438U 90005C 94192.24485394 -.00000022 00000-0 83477-5 0 8083
2 20438 98.5894 275.6425 0010695 120.4722 239.7514 14.29179702232945
PACSAT
1 20439U 90005D 94195.78079047 .00000010 00000-0 20657-4 0 8086
2 20439 98.5977 281.4443 0012030 108.0022 252.2471 14.29903339233543
DO-17
1 20440U 90005E 94195.24266090 -.00000000 00000-0 16905-4 0 8086
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2 20440 98.5985 281.2451 0012121 108.6683 251.5815 14.30042790233485
WO-18
1 20441U 90005F 94193.67915633 .00000013 00000-0 21986-4 0 8107
2 20441 98.5990 279.7005 0012641 113.6115 246.6399 14.30016962233262
LO-19
1 20442U 90005G 94192.18636356 .00000011 00000-0 20960-4 0 8069
2 20442 98.5997 278.4886 0012869 117.3153 242.9341 14.30113219233065
GPS BII-06
1 20452U 90008A 94195.27492363 .00000087 00000-0 10000-3 0 9241
2 20452 54.0542 195.4228 0052710 74.6541 285.9546 2.00553242 32690
MOS-1B
1 20478U 90013A 94195.21442173 .00000091 00000-0 10000-3 0 6492
2 20478 99.0355 267.4842 0000644 122.4938 237.6286 13.94900999146413
DEBUT
1 20479U 90013B 94194.89672803 -.00000010 00000-0 59357-4 0 8045
2 20479 99.0381 341.7853 0539933 278.7468 75.2873 12.83320706207563
FO-20
1 20480U 90013C 94189.41964946 -.00000031 00000-0 10578-4 0 7045
2 20480 99.0382 337.2291 0540391 291.4400 62.9899 12.83226051206850
MOS-1B R/B
1 20491U 90013D 94195.55707437 -.00000560 00000-0 -99606-3 0 239
2 20491 99.0177 27.9962 0470272 143.3415 220.0862 13.02967978210228
LACE
1 20496U 90015A 94192.67767902 .00001328 00000-0 49195-4 0 4244
2 20496 43.1041 269.4333 0009939 169.7446 190.3614 15.33176225245283
Nadezhda 2
1 20508U 90017A 94195.85065086 .00000071 00000-0 58942-4 0 450
2 20508 82.9523 42.0058 0044515 161.7276 198.5492 13.73478140219349
OKEAN 2
1 20510U 90018A 94193.90353565 .00000228 00000-0 28080-4 0 3187
2 20510 82.5237 160.9663 0020661 102.9415 257.4105 14.78349754235461
INTELSAT-6
1 20523U 90021A 94190.19248843 -.00000239 00000-0 10000-3 0 4260
2 20523 0.0061 328.8485 0000853 196.4131 156.3981 1.00269438 8824
GPS BII-07
1 20533U 90025A 94195.67621445 -.00000065 00000-0 10000-3 0 9235
2 20533 55.0071 315.8276 0044240 83.4645 277.0587 2.00577018 31470
PegSat
1 20546U 90028A 94193.33268251 .00005288 00000-0 12493-3 0 6545
2 20546 94.1273 312.1591 0071944 198.4587 161.4060 15.39225830236135
HST
1 20580U 90037B 94195.87150304 .00000386 00000-0 23248-4 0 5064
2 20580 28.4689 58.1434 0006096 18.7145 341.3659 14.90639308 33523
MACSAT 2
1 20608U 90043B 94192.38706690 .00000221 00000-0 35437-4 0 77
2 20608 89.9249 179.3889 0107579 8.1031 352.1893 14.64724621222820
Glonass 44
1 20619U 90045A 94194.71974376 -.00000035 00000-0 00000+0 0 963
2 20619 65.3477 348.0308 0023671 208.7109 151.1651 2.13102682 32295
Glonass 45
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1 20620U 90045B 94195.30765596 -.00000035 00000-0 00000+0 0 1009
2 20620 65.3468 348.0118 0007979 48.7793 311.2778 2.13102947 32349
Glonass 46
1 20621U 90045C 94194.43418183 -.00000035 00000-0 10000-3 0 7135
2 20621 65.3587 348.0695 0013824 188.9889 170.9915 2.13101477 32329
Kristall
1 20635U 90048A 94195.10064799 .00001337 00000-0 25292-4 0 7661
2 20635 51.6473 51.7703 0002357 126.0563 234.1631 15.56559228480197
ROSAT
1 20638U 90049A 94196.19613704 .00000083 00000-0 24598-4 0 3178
2 20638 52.9913 223.7325 0014336 151.2760 208.9012 15.06870097226301
Meteor 2-19
1 20670U 90057A 94193.02564718 .00000030 00000-0 13553-4 0 8077
2 20670 82.5382 188.7333 0017853 77.2924 283.0207 13.84189830204051
CRRES
1 20712U 90065A 94195.02481939 .00000031 00000-0 19587-4 0 9343
2 20712 17.6270 177.5445 7182190 208.9446 77.6378 2.35158143 26526
GPS BII-08
1 20724U 90068A 94196.00104690 .00000034 00000-0 10000-3 0 8100
2 20724 54.7634 136.8970 0110537 163.8271 196.5172 2.00561507 28901
Feng Yun1-2
1 20788U 90081A 94195.24794903 -.00000080 00000-0 -24605-4 0 148
2 20788 98.8360 214.5248 0015548 299.4174 60.5440 14.01356584197492
Meteor 2-20
1 20826U 90086A 94192.24637361 .00000056 00000-0 37102-4 0 8153
2 20826 82.5260 126.8437 0013852 348.2605 11.8236 13.83584780191088
GPS BII-09
1 20830U 90088A 94194.06130817 -.00000018 00000-0 10000-3 0 8208
2 20830 55.4856 79.2790 0067279 103.2316 257.5857 2.00563717 27941
GPS BIIA-10
1 20959U 90103A 94193.95979152 .00000043 00000-0 00000+0 0 7232
2 20959 54.9650 138.8909 0085349 226.4501 132.8196 2.00564514 26536
DMSP B5D2-5
1 20978U 90105A 94195.68636979 .00000134 00000-0 63505-4 0 7981
2 20978 98.6837 259.2768 0080471 83.2561 277.7769 14.32439257189130
Glonass 47
1 21006U 90110A 94195.87091886 .00000004 00000-0 00000+0 0 6771
2 21006 64.9619 108.4473 0059571 188.1886 171.7525 2.13102633 28021
Glonass 48
1 21007U 90110B 94194.17992249 .00000019 00000-0 00000+0 0 7921
2 21007 64.9757 108.5746 0035780 181.4420 178.5769 2.13101186 27975
Glonass 49
1 21008U 90110C 94194.06759518 .00000019 00000-0 00000+0 0 7975
2 21008 64.9562 108.5268 0009700 282.8694 77.0516 2.13099634 27967
AO-21
1 21087U 91006A 94194.16588839 .00000094 00000-0 82657-4 0 4887
2 21087 82.9469 123.4935 0036545 13.7087 346.5049 13.74542040173152
RS-12/13
1 21089U 91007A 94194.88952093 .00000027 00000-0 12522-4 0 7070
2 21089 82.9198 351.6397 0030785 35.6257 324.6938 13.74043526172318
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MOP-2
1 21140U 91015B 94194.33789885 -.00000007 00000-0 00000+0 0 7368
2 21140 0.2554 16.7030 0003343 126.3163 269.8302 1.00267010 432
Nadezhda 3
1 21152U 91019A 94195.82738141 .00000008 00000-0 -82312-5 0 8419
2 21152 82.9262 306.7391 0042823 137.2182 223.2319 13.73504045167192
Glonass 50
1 21216U 91025A 94191.66552487 -.00000042 00000-0 10000-3 0 3115
2 21216 65.0955 347.8993 0009104 201.2218 158.7422 2.13103277 25447
Glonass 51
1 21217U 91025B 94194.54824074 -.00000036 00000-0 00000+0 0 6986
2 21217 65.0880 347.8096 0010429 227.6963 132.8734 2.13101612 25495
Glonass 52
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2 21218 65.0729 347.7468 0006562 319.7638 40.1759 2.13102540 25528
GRO
1 21225U 91027B 94195.92878001 .00001884 00000-0 38194-4 0 1154
2 21225 28.4612 39.5353 0003887 165.4939 194.5779 15.41039990 61222
Meteor 3-4
1 21232U 91030A 94192.41447599 .00000051 00000-0 10000-3 0 7146
2 21232 82.5397 152.4638 0013853 120.2656 239.9835 13.16463320154544
NOAA 12
1 21263U 91032A 94195.76827747 .00000166 00000-0 93748-4 0 972
2 21263 98.6153 222.9368 0013039 152.0397 208.1485 14.22428373164424
OKEAN 3
1 21397U 91039A 94193.16591644 .00000223 00000-0 28787-4 0 181
2 21397 82.5246 73.6544 0021937 173.8047 186.3445 14.76227767167196
GPS BIIA-11
1 21552U 91047A 94192.23957108 -.00000012 00000-0 10000-6 0 7322
2 21552 55.7774 76.9445 0055073 237.6771 121.8579 2.00560181 22099
ERS-1
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2 21574 98.4998 269.9986 0001408 88.8358 271.2649 14.35941108156672
UO-22
1 21575U 91050B 94194.66619103 .00000045 00000-0 29726-4 0 5113
2 21575 98.4338 268.6283 0007042 206.6952 153.3878 14.36923444156888
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2 21576 98.4322 267.9992 0003141 208.8146 151.2865 14.36322162156890
TUBSAT-A
1 21577U 91050D 94195.75027126 .00000006 00000-0 16817-4 0 5084
2 21577 98.4328 268.9506 0005763 205.9976 154.0920 14.36446226156992
SARA
1 21578U 91050E 94195.22637703 .00000216 00000-0 84279-4 0 7054
2 21578 98.4424 271.8879 0004335 202.9373 157.1620 14.38802138157091
TDRS 4
1 21639U 91054B 94191.68464021 .00000084 00000-0 10000-3 0 7652
2 21639 0.0552 245.0375 0001740 176.3952 299.0480 1.00270076104815
Meteor 3-5
1 21655U 91056A 94194.19428742 .00000051 00000-0 10000-3 0 7239
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2 21655 82.5532 98.3833 0013766 126.6238 233.6140 13.16831903139884
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1 21701U 91063B 94192.89558286 .00003368 00000-0 31530-3 0 5548
2 21701 56.9857 60.0520 0005570 103.1912 256.9743 14.96455115154636
DMSP B5D2-6
1 21798U 91082A 94195.90318448 .00000104 00000-0 78874-4 0 4484
2 21798 98.9642 201.8314 0014020 60.1692 300.0873 14.13818486135595
Glonass 53
1 21853U 92005A 94193.93523416 .00000020 00000-0 10000-3 0 9103
2 21853 64.9091 108.2260 0006834 205.7798 154.2176 2.13102420 19098
Glonass 54
1 21854U 92005B 94194.22723172 .00000018 00000-0 00000+0 0 9885
2 21854 64.9025 108.2104 0016456 14.0345 346.0412 2.13103301 19085
Glonass 55
1 21855U 92005C 94192.88095082 .00000022 00000-0 00000+0 0 9917
2 21855 64.9047 108.2570 0006855 209.3117 150.6781 2.13102301 19048
JERS-1
1 21867U 92007A 94195.79379505 .00000200 00000-0 21620-4 0 3558
2 21867 97.7434 270.5501 0002266 96.5531 263.5820 14.98606939132518
GPS BIIA-12
1 21890U 92009A 94195.68898032 .00000009 00000-0 10000-3 0 5294
2 21890 54.1052 255.6293 0057500 169.6955 190.4890 2.00567342 17535
GPS BIIA-13
1 21930U 92019A 94188.42216960 -.00000052 00000-0 10000-3 0 5051
2 21930 55.6242 17.0238 0050777 167.4818 192.7114 2.00564621 16315
EUVE
1 21987U 92031A 94196.07941812 .00000926 00000-0 33994-4 0 3165
2 21987 28.4337 226.5497 0009498 280.4773 79.4763 15.18617334116645
SAMPEX
1 22012U 92038A 94195.33446008 .00000457 00000-0 38359-4 0 5371
2 22012 81.6720 142.2339 0118418 311.7151 47.3978 14.91005585110322
GPS BIIA-14
1 22014U 92039A 94180.97512054 .00000057 00000-0 00000+0 0 4229
2 22014 54.8744 197.2344 0084822 300.3481 58.8470 2.00562510 8007
Glonass 56
1 22056U 92047A 94193.71990089 -.00000037 00000-0 00000+0 0 9019
2 22056 64.9251 348.0259 0003652 262.8341 97.1246 2.13103018 15157
Glonass 57
1 22057U 92047B 94194.95272757 -.00000036 00000-0 00000+0 0 9000
2 22057 64.9311 347.9997 0005989 324.7142 35.2519 2.13102460 15150
Glonass 58
1 22058U 92047C 94193.01636503 -.00000039 00000-0 00000+0 0 9126
2 22058 64.9302 348.0744 0008321 274.8132 85.0888 2.13102948 15164
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2 22076 66.0425 236.9833 0007479 263.2500 96.7664 12.80930398 89829
KO-23
1 22077U 92052B 94194.13082891 -.00000037 00000-0 10000-3 0 4063
2 22077 66.0832 225.6621 0015044 281.6382 78.2949 12.86286951 90122
S80/T
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1 22078U 92052C 94194.13308746 -.00000037 00000-0 10000-3 0 4031
2 22078 66.0840 224.9167 0016429 279.6648 80.2515 12.86569366 90192
GPS BIIA-15
1 22108U 92058A 94190.41683918 .00000023 00000-0 10000-3 0 4220
2 22108 54.3163 256.5736 0112289 141.5071 219.3758 2.00558645 13377
FREJA
1 22161U 92064A 94191.59834212 -.00000123 00000-0 -72180-5 0 4188
2 22161 63.0008 233.4588 0785349 317.1545 37.0756 13.21765709 84894
LAGEOS II
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2 22195 52.6572 78.3822 0138772 127.7905 233.5312 6.47293720 40516
GPS BIIA-16
1 22231U 92079A 94193.09754212 .00000076 00000-0 00000+0 0 4181
2 22231 54.6792 197.9435 0022529 299.5190 60.2495 2.00555738 12002
GPS BIIA-17
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2 22275 54.6449 195.4657 0053361 252.6369 106.7918 2.00564576 11436
TDRS 5
1 22314U 93003B 94194.17053241 -.00000280 00000-0 10000-3 0 4144
2 22314 1.1573 73.0278 0002183 27.1317 206.3173 1.00267171 5511
GPS BIIA-18
1 22446U 93007A 94194.30531120 -.00000060 00000-0 00000+0 0 4170
2 22446 54.6524 316.2469 0072484 339.5461 20.1938 2.00569997 10420
Glonass 59
1 22512U 93010A 94193.93622787 .00000020 00000-0 00000+0 0 6005
2 22512 64.9187 108.0784 0008547 201.4525 158.5450 2.13102197 10667
Glonass 60
1 22513U 93010B 94195.28412629 .00000010 00000-0 00000+0 0 6131
2 22513 64.9159 108.0414 0006406 200.9406 159.0677 2.13103190 10886
Glonass 61
1 22514U 93010C 94195.98964492 .00000002 00000-0 00000+0 0 5982
2 22514 64.9249 108.0112 0013109 193.1494 166.8487 2.13101623 10907
ASTRO-D
1 22521U 93011A 94194.56420942 .00000499 00000-0 36529-4 0 3079
2 22521 31.1065 270.2791 0076375 350.5244 9.3952 14.93269639 76046
UFO F1
1 22563U 93015A 94178.95064083 .00000045 00000-0 10000-3 0 3032
2 22563 26.6281 299.6379 0002162 223.7126 321.4247 0.99248731 8941
GPS BIIA-19
1 22581U 93017A 94191.95323438 -.00000051 00000-0 10000-3 0 3152
2 22581 55.1256 16.6218 0048984 35.7529 324.5540 2.00565857 9439
ARSENE
1 22654U 93031B 94188.21304092 -.00000116 00000-0 00000+0 0 2649
2 22654 1.8958 98.1428 2918247 185.7752 169.5951 1.42202950 1486
GPS BIIA-20
1 22657U 93032A 94192.59053432 -.00000052 00000-0 00000+0 0 3301
2 22657 55.1585 16.4003 0062311 205.8275 153.8788 2.00555362 4775
RADCAL
1 22698U 93041A 94192.83735015 .00000041 00000-0 11713-4 0 3122
2 22698 89.5478 308.1313 0093279 106.1395 255.0087 14.21315027 54095
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1 22700U 93042A 94193.55119475 .00000013 00000-0 00000+0 0 3090
2 22700 54.5054 257.2010 0028685 319.8839 40.0071 2.00554838 7591
NOAA 13
1 22739U 93050A 94195.87390556 .00000027 00000-0 39821-4 0 4958
2 22739 98.9476 140.1552 0011030 45.3698 314.8369 14.10901822 47874
GPS BIIA-22
1 22779U 93054A 94193.13860075 -.00000059 00000-0 10000-3 0 3470
2 22779 54.7919 316.2235 0023109 230.1923 129.6308 2.00575791 6349
Meteor 2-21
1 22782U 93055A 94194.41246650 .00000037 00000-0 19902-4 0 3155
2 22782 82.5469 185.6515 0023001 148.4453 211.8095 13.83010359 43717
UFO F2
1 22787U 93056A 94195.73058890 -.00000060 00000-0 00000+0 0 2929
2 22787 4.8109 323.5986 0009140 149.9473 153.0550 1.00273418 3364
SPOT 3
1 22823U 93061A 94192.74226596 .00000093 00000-0 64372-4 0 3264
2 22823 98.7140 266.8538 0000976 90.1993 269.9296 14.20032850 40977
STELLA
1 22824U 93061B 94189.22397497 -.00000040 00000-0 15411-5 0 3043
2 22824 98.6515 264.6968 0006691 140.8940 219.2724 14.27097417 40679
AO-27
1 22825U 93061C 94193.74755536 .00000004 00000-0 19606-4 0 3046
2 22825 98.6530 269.3004 0009155 129.4928 230.7062 14.27628830 41333
IO-26
1 22826U 93061D 94192.74556263 .00000003 00000-0 18991-4 0 3047
2 22826 98.6522 268.3468 0009568 134.0785 226.1185 14.27733130 41198
HEATHSAT
1 22827U 93061E 94192.72427904 .00000019 00000-0 25584-4 0 3666
2 22827 98.6499 268.2930 0009216 120.3001 239.9097 14.27844603 41196
PO-28
1 22829U 93061G 94193.24660920 .00000013 00000-0 22747-4 0 2978
2 22829 98.6491 268.8716 0010740 120.3722 239.8519 14.28032813 41272
KO-25
1 22830U 93061H 94193.17093563 -.00000010 00000-0 13333-4 0 3098
2 22830 98.5531 265.7524 0012396 101.6312 258.6268 14.28059498 41264
GPS BIIA-23
1 22877U 93068A 94194.68735932 -.00000024 00000-0 10000-3 0 1423
2 22877 55.1949 77.3643 0032496 289.7719 69.9449 2.00573780 5264
METEOSAT 6
1 22912U 93073B 94195.35565472 -.00000081 00000-0 00000+0 0 1073
2 22912 0.8350 267.3087 0001813 241.2330 261.9931 1.00275010 800
HST Array
1 22920U 90037C 94194.66385578 .00003975 00000-0 32294-3 0 1662
2 22920 28.4740 54.8380 0004364 193.3534 166.6890 14.97102737 33468
Soyuz TM-18
1 22957U 94001A 94189.77184474 -.00008640 00000-0 -11296-3 0 1705
2 22957 51.6467 78.4268 0002644 119.3454 240.8360 15.56479768 28320
Meteor 3-6
1 22969U 94003A 94195.06065223 .00000051 00000-0 10000-3 0 784
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2 22969 82.5578 37.2959 0014507 194.6388 165.4321 13.16723536 22380
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1 22970U 94003B 94193.98386172 .00000051 00000-0 10000-3 0 683
2 22970 82.5583 38.0363 0015307 192.0034 168.0734 13.16822240 22249
ODERACS A
1 22990U 94006B 94196.19669597 .00064868 12082-4 18210-3 0 1268
2 22990 56.9830 197.0333 0005549 192.3872 167.8149 15.93895789 24631
ODERACS B
1 22991U 94006C 94196.24055835 .00067503 12191-4 19458-3 0 1185
2 22991 56.9820 197.2951 0004804 182.0186 178.1558 15.93366356 24638
ODERACS E
1 22994U 94006F 94191.10966972 .00021393 00000-0 10436-3 0 917
2 22994 56.9828 225.9868 0010669 192.1538 167.9277 15.82332740 23747
ODERACS F
1 22995U 94006G 94194.20245429 .00018499 00000-0 89634-4 0 1189
2 22995 56.9821 211.8430 0009531 192.7918 167.2910 15.82607354 24232
BREMSAT
1 22998U 94006H 94195.17920353 .00019632 00000-0 98051-4 0 1021
2 22998 56.9889 208.4199 0005552 194.7336 165.3570 15.81942612 24226
GPS BIIA-24
1 23027U 94016A 94195.76421312 -.00000052 00000-0 00000+0 0 693
2 23027 54.9654 18.3767 0062299 191.1462 168.7560 2.00561426 2598
Glonass 62
1 23043U 94021A 94195.18640857 -.00000036 00000-0 00000+0 0 658
2 23043 64.8113 348.4366 0006647 175.5600 184.4517 2.13103076 2003
Glonass 63
1 23044U 94021B 94195.06929783 -.00000036 00000-0 00000+0 0 485
2 23044 64.8041 348.4415 0029116 200.8212 159.0633 2.13103190 2000
Glonass 64?
1 23045U 94021C 94194.74542427 -.00000036 00000-0 00000+0 0 532
2 23045 64.7866 348.4549 0002051 343.4837 16.5152 2.12796888 1990
GOES 8
1 23051U 94022A 94194.39622731 -.00000179 00000-0 00000+0 0 1290
2 23051 0.3915 264.9644 0001936 259.9390 178.4053 1.00258548 553
Intelsat7F2
1 23124U 94034A 94193.16449546 -.00000254 00000-0 00000+0 0 304
2 23124 0.0631 186.8837 0011393 296.0612 188.3937 1.00270509 168
STRV-1A
1 23125U 94034B 94192.63911318 .00000115 00000-0 17659-3 0 179
2 23125 7.0148 175.8986 7273683 197.4171 109.1753 2.27301743 561
STRV-1B
1 23126U 94034C 94192.68176778 .00000089 00000-0 14675-3 0 173
2 23126 7.0136 175.9616 7279408 197.4088 108.6641 2.26897423 562
1994034D
1 23127U 94034D 94192.94781760 -.00000041 00000-0 10000-4 0 152
2 23127 7.0315 176.4743 7259531 196.6873 112.2251 2.20412447 557
1994035B
1 23133U 94035B 94194.52203031 .00045770 00000-0 15388-2 0 267
2 23133 26.9586 283.6921 5377728 205.1367 114.3289 5.09662617 992
1994032D
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1 23134U 94032D 94195.93305524 .00619175 13271-3 19683-2 0 378
2 23134 82.5698 351.4912 0112376 291.2837 67.9272 15.81394788 5989
1994032E
1 23135U 94032E 94196.06331548 .01141058 47336-3 41689-2 0 336
2 23135 82.5707 351.5101 0129297 286.0484 72.1826 15.76334196 5997
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1 23136U 94032F 94186.99350058 .41356391 -10540-5 27184-2 0 230
2 23136 82.5570 0.6241 0017501 20.6338 349.0789 16.39644744 4601
1994032G
1 23137U 94032G 94191.88228812 .05868062 -12221-5 20188-3 0 292
2 23137 82.5672 355.0566 0024782 33.7945 337.1968 16.41573358 5399
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1 23138U 94032H 94196.09342570 .00134290 63478-5 18098-3 0 390
2 23138 82.5788 350.6126 0051892 354.7031 5.3971 16.03584437 6055
Soyuz TM-19
1 23139U 94036A 94195.10064799 .00001337 00000-0 25292-4 0 230
2 23139 51.6473 51.7703 0002357 126.0563 234.1631 15.56559228 1985
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1 23141U 94033C 94195.37357206 .01877582 16997-2 72724-2 0 336
2 23141 62.7871 339.8070 0059974 18.5335 342.1043 15.84289479 4719
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1 23142U 94033D 94194.82587938 .00288995 32510-4 18786-2 0 267
2 23142 62.8137 342.0732 0085321 20.8064 339.6530 15.70636074 4621
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1 23143U 94033E 94195.03634551 .00005540 81146-5 10000-4 0 150
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2 23144 062.8043 336.6926 0008571 127.7428 232.5492 16.35259482004776
FSW 2
1 23145U 94037A 94196.25658028 .00244056 81448-5 98706-4 0 304
2 23145 62.9543 301.5974 0126092 142.7148 218.2651 16.06737277 1925
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1 23146U 94037B 94194.49305556 .11807306 88476-5 11237-3 0 388
2 23146 62.9425 307.7875 0012128 158.2797 204.5906 16.50544985 1651
Cosmos 2282
1 23168U 94038A 94195.89241385 -.00000191 00000-0 00000+0 0 163
2 23168 2.2813 292.0410 0009709 313.4912 344.5233 1.00229778 127
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1 23169U 94038B 94190.67837400 .05672473 12609-4 11149-3 0 113
2 23169 51.6438 278.8086 0008924 283.6959 76.3228 16.46551738 446
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1 23170U 94038C 94189.02996696 .16894393 12672-4 22210-3 0 104
2 23170 51.6338 288.0859 0001025 44.2765 315.8363 16.49395276 176
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1 23171U 94038D 94195.90038205 -.00000247 00000-0 10000-3 0 60
2 23171 2.3402 292.0332 0019839 5.6229 296.3732 0.99432330 74
1994038E
1 23172U 94038E 94191.40329783 -.00000187 00000-0 10000-4 0 48
2 23172 47.8804 291.4020 7285146 0.7146 359.8470 2.25444485 9011
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1 23173U 94039A 94196.25000000 .00002055 00000-0 47047-5 0 234
2 23173 28.4690 318.7145 0002792 13.5851 219.3707 15.90732990 1048
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1 23174U 94038F 94189.63147236 .03238761 00000-0 59326+1 0 35
2 23174 47.9544 291.8792 7263552 0.3524 359.9234 2.24222805 8981
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1 23175U 94040A 94196.13555596 .00000116 00000-0 10000-4 0 166
2 23175 0.0457 322.6998 0034401 126.8731 86.9326 1.00254202 106
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1 23176U 94040B 94195.87513675 -.00000366 00000-0 10000-4 0 112
2 23176 0.2548 275.3112 0016743 87.7585 356.0488 1.00528709 64
1994040C
1 23177U 94040C 94192.45633475 -.00000093 00000-0 10000-4 0 55
2 23177 7.4939 86.8624 7296631 182.0352 170.9444 2.20406967 31
1994040D
1 23178U 94040D 94194.13183852 .00032480 00000-0 50536-2 0 85
2 23178 6.9748 87.5800 7291676 181.4056 173.8032 2.28167121 79
1994041A
1 23179U 94041A 94195.78578670 .00000024 00000-0 10000-4 0 44
2 23179 82.9471 37.9199 0035219 289.4241 70.3120 13.75652051 89
1994041B
1 23180U 94041B 94196.22112954 .00022809 00000-0 22908-1 0 47
2 23180 82.9444 37.5997 0027314 287.9059 71.9141 13.77204872 143
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1068. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 19:12:21 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774299541@afit.af.mil>
Source record: 27161

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94196.25000000 .00002055 00000-0 47047-5 0 234
2 23173 28.4690 318.7145 0002792 13.5851 219.3707 15.90732990 1048
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1069. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 19:12:38 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774299558@afit.af.mil>
Source record: 27203
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94196.25000000 .00002055 00000-0 47047-5 0 234
2 23173 28.4690 318.7145 0002792 13.5851 219.3707 15.90732990 1048
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1070. Re: Alaska EME Ham

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 19:21:05 UTC
From: micron3@aol.com
Message-ID: <306nj1$r4u@search01.news.aol.com>
Source record: 27171

In article <1994Jul15.012926.19799@hounix.org>, mm1@hounix.org (John Donaldson) writes:

essage-ID: <1994Jul15.012926.19799@hounix.org>

> A few weeks ago, my wife and I were visiting friends in anchorage, Alaska.
>While out and about, I came across a large 2 meter EME array. I tried the >door of the house, but no one was home. I never did get another chance to go
>back to his house. I did take a couple of pictures of his array.
> I would like to get in touch with him, if possible via mail, packet, or >Internet.

My data base for 2 Meter EME types has two listings for Alaska

Mike Turner KL7X
2900 Wendy's Way
Anchorage, Alaska 99517

Chris Hazlitt KL7FB
3741 Gary Cooper Cir
Anchorage, Alaska 99507

The data base lists KL7X as having 12 yagis of 8 elements each but does not
list KL7FB's array. Hope this helps.

Terry KJ7F

1071. STS-65 Orbital State Vector Rev #109

Newsgroup: rec.radio.amateur.space
Date: 1994-07-15 19:40:30 UTC
From: astroman@netcom.com
Message-ID: <astromanCszynI.FsK@netcom.com>
Source record: 27162
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 7
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94196.50356896991
07/15/1994 12:05:08.359 UTC
ECI X: -5539.250085 km
Y: -2282.731691 km
Z: -2955.664000 km
Xdot: 3.509004150 km/s
Ydot: -6.744591778 km/s
Zdot: -1.365649000 km/s
ndot/2 (drag): 0.00078072030 rev/day^2
nddt/6: 2.55681E-08 rev/day^3
Bstar: 2.36464E-04 1/Earth Radii
Elset #: 19
Rev @ Epoch: 109.68951172034

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1072. Re: TAPR/AMSAT DSP-93 Kit Announcement

Newsgroup: rec.radio.amateur.space
Date: 1994-07-16 02:49:02 UTC
From: mmoulding@delphi.com
Message-ID: <9407152248591.mmoulding.DLITE@delphi.com>
Source record: 27163

Yes Please pass along the full announcement and description.

Thanks, 73, Mark, KE7NS

mmoulding.delphi.com

1073. STS-65 Orbital State Vector Rev #114

Newsgroup: rec.radio.amateur.space
Date: 1994-07-16 07:09:16 UTC
From: astroman@netcom.com
Message-ID: <astromanCt0uJG.Etx@netcom.com>
Source record: 27164
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 93039A
Epoch Date/Time: 94196.79331972222
07/15/1994 19:02:22.824 UTC
EFG E: -17074121.24 ft
F: -9649239.43 ft
G: 9720787.40 ft
Edot: 9646.1531 ft/s
Fdot: -21508.3828 ft/s
Gdot: -4371.9025 ft/s
ndot/2 (drag): 0.00080225329 rev/day^2
nddt/6: 2.69979E-08 rev/day^3
Bstar: 2.42933E-04 1/Earth Radii
Elset #: 20
Rev @ Epoch: 114.30878762479

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1074. STS-65 Orbital State Vector Rev #125

Newsgroup: rec.radio.amateur.space
Date: 1994-07-16 13:20:56 UTC
From: astroman@netcom.com
Message-ID: <astromanCt1Bqx.24K@netcom.com>
Source record: 27165
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94197.50354416667
07/16/1994 12:05:06.216 UTC
EFG E: 10968501.30 ft
F: 17347818.39 ft
G: -7688412.37 ft
Edot: -20480.6021 ft/s
Fdot: 9330.1723 ft/s
Gdot: -8180.5225 ft/s
ndot/2 (drag): 0.00070018814 rev/day^2
nddt/6: 2.05643E-08 rev/day^3
Bstar: 2.11165E-04 1/Earth Radii
Elset #: 21
Rev @ Epoch: 125.63157418125

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1075. info on parabolic dish

Newsgroup: rec.radio.amateur.space
Date: 1994-07-16 17:59:46 UTC
From: subas@intnet.pc.my
Message-ID: <774381586.9snx@intnet.pc.my>
Source record: 27166

hi there everyone!!i am trying to find out some info about a dish that i bought.the length of the dish is about 9ft long.can someone please tell me why do people say that the 12ft dish can receive more channels then the 9ft dish.does the length of the dish make any diffrent.can sommeone also please tell me what is the best way to allign the dish.this is the first time that i am installing a satelite parabolic dish.the colour of my plates are silver in colour.i would like to paint it black.does painting it black effect the signal.will there be any signal lost.the dish that i bought did not come with a installation manual,so i really need some help in installing the dish. please help!!!

thaking you in advance.
yours trully
subas

1076. STS-65 Element Set (94197.275)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-16 18:15:50 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94197.275@alsys.com>
Source record: 27167
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94197.27576731 +.00077033 00000-0 23048-3 0 259
2 23173 28.4687 311.0423 0002865 30.0967 329.9809 15.90866972 1221

Satellite: STS-65
Catalog number: 23173
Epoch time: 94197.27576731 (16 JUL 94 06:37:06.30 UTC)
Element set: GSFC-025a
Inclination: 28.4687 deg
RA of node: 311.0423 deg Space Shuttle Flight STS-65
Eccentricity: 0.0002865 Keplerian Elements
Arg of perigee: 30.0967 deg
Mean anomaly: 329.9809 deg
Mean motion: 15.90866972 rev/day Semi-major Axis: 6677.9878 Km
Decay rate: 7.7033E-04 rev/day*2 Apogee Alt: 301.51 Km
Epoch rev: 122 Perigee Alt: 297.69 Km

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1077. SAREX Keps 7/16

Newsgroup: rec.radio.amateur.space
Date: 1994-07-16 23:56:52 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.011.1994@ampr.org>
Source record: 27179
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.011
SAREX Keps 7/16 at 10:20 UTC

Greenbelt, MD 7/16 at 10:20 UTC

At this time, the official SAREX Orbital element set for the STS-65 Space SShuttle Mission is set GSFC-025a with the NORAD drag values corrected by Gil Carman, WA5NOM. This set was generated by Ron Parise, WA4SIR at the Goddard Space Flight Center. Predictions with this set were 3 seconds earlier than GSFC-023a at 0830 UTC on orbit 123.

STS-65
1 23173U 94039A 94197.27576731 0.00077033 00000-0 23048-3 0 259
2 23173 28.4687 311.0423 0002865 30.0967 329.9809 15.90866972 1221

Satellite: STS-65
Catalog number: 23173
Epoch time: 94197.27576731 (16 JUL 94 06:37:06.30 UTC)
Element set: GSFC-025a
Inclination: 28.4687 deg
RA of node: 311.0423 deg Space Shuttle Flight STS-65
Eccentricity: 0.0002865 Keplerian Elements
Arg of perigee: 30.0967 deg
Mean anomaly: 329.9809 deg
Mean motion: 15.90866972 rev/day Semi-major Axis: 6677.9878 Km
Decay rate: 7.7033E-04 rev/day*2 Apogee Alt: 301.51 Km
Epoch rev: 122 Perigee Alt: 297.69 Km

NOTE - This element set is based on NORAD element set # 025.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1078. ARLK028 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 02:09:41 UTC
From: w1aw@arrl.org
Message-ID: <$arlk028.1994@ampr.org>
Source record: 27170
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK028
ARLK028 Keplerian data

ZCZC SK95
QST de W1AW
Keplerian Bulletin 28 ARLK028
From ARRL Headquarters
Newington, CT July 16, 1994
To all radio amateurs

SB KEP ARL ARLK028
ARLK028 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-65
1 23173U 94039A 94196.27214970 0.00067371 00000-0 20209-3 0 230
2 23173 28.4690 318.5489 0002791 13.8590 346.2097 15.90733062 1064
AO-10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 55387
RS-10/11
1 18129U 87054A 94191.83829016 .00000023 00000-0 90572-5 0 9258
2 18129 82.9253 311.3579 0011286 326.8723 33.1722 13.72339043353150
UO-11
1 14781U 84021B 94195.06242397 .00000083 00000-0 21899-4 0 7078
2 14781 97.7856 208.5283 0011425 178.8317 181.2912 14.69229240554255
RS-12/13
1 21089U 91007A 94194.88952093 .00000027 00000-0 12522-4 0 7070
2 21089 82.9198 351.6397 0030785 35.6257 324.6938 13.74043526172318
AO-13
1 19216U 88051B 94195.90619677 .00000281 00000-0 10000-4 0 9305
2 19216 57.7690 241.9596 7219247 345.7696 1.7723 2.09719219 15098
UO-14
1 20437U 90005B 94194.18674123 .00000006 00000-0 19106-4 0 98
2 20437 98.5896 278.6106 0011733 112.1063 248.1368 14.29849139233305
AO-16
1 20439U 90005D 94195.78079047 .00000010 00000-0 20657-4 0 8086
2 20439 98.5977 281.4443 0012030 108.0022 252.2471 14.29903339233543
```

```
DO-17
1 20440U 90005E 94195.24266090 -.00000000 00000-0 16905-4 0 8086
2 20440 98.5985 281.2451 0012121 108.6683 251.5815 14.30042790233485
WO-18
1 20441U 90005F 94193.67915633 .00000013 00000-0 21986-4 0 8107
2 20441 98.5990 279.7005 0012641 113.6115 246.6399 14.30016962233262
LO-19
1 20442U 90005G 94196.24430425 -.00000013 00000-0 11687-4 0 8079
2 20442 98.5998 282.4984 0013130 106.5314 253.7309 14.30113337233640
FO-20
1 20480U 90013C 94189.41964946 -.00000031 00000-0 10578-4 0 7045
2 20480 99.0382 337.2291 0540391 291.4400 62.9899 12.83226051206850
AO-21
1 21087U 91006A 94194.16588839 .00000094 00000-0 82657-4 0 4887
2 21087 82.9469 123.4935 0036545 13.7087 346.5049 13.74542040173152
UO-22
1 21575U 91050B 94194.66619103 .00000045 00000-0 29726-4 0 5113
2 21575 98.4338 268.6283 0007042 206.6952 153.3878 14.36923444156888
KO-23
1 22077U 92052B 94194.13082891 -.00000037 00000-0 10000-3 0 4063
2 22077 66.0832 225.6621 0015044 281.6382 78.2949 12.86286951 90122
KO-25
1 22830U 93061H 94193.17093563 -.00000010 00000-0 13333-4 0 3098
2 22830 98.5531 265.7524 0012396 101.6312 258.6268 14.28059498 41264
IO-26
1 22826U 93061D 94192.74556263 .00000003 00000-0 18991-4 0 3047
2 22826 98.6522 268.3468 0009568 134.0785 226.1185 14.27733130 41198
AO-27
1 22825U 93061C 94193.74755536 .00000004 00000-0 19606-4 0 3046
2 22825 98.6530 269.3004 0009155 129.4928 230.7062 14.27628830 41333
PO-28
1 22829U 93061G 94193.24660920 .00000013 00000-0 22747-4 0 2978
2 22829 98.6491 268.8716 0010740 120.3722 239.8519 14.28032813 41272
Arsene
1 22654U 93031B 94188.21304092 -.00000116 00000-0 00000+0 0 2649
2 22654 1.8958 98.1428 2918247 185.7752 169.5951 1.42202950 1486
Mir
1 16609U 86017A 94195.87104505 .00002463 00000-0 40816-4 0 6818
2 16609 51.6466 47.9107 0002406 137.5799 222.5380 15.56566564480332

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
July 19, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1079. STS-65 Orbital State Vector Rev #130

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 05:40:38 UTC
From: astroman@netcom.com
Message-ID: <astromanCt2L3q.D4t@netcom.com>
Source record: 27168
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94197.79337881944
07/16/1994 19:02:27.930 UTC
EFG E: -19232178.34 ft
F: 599783.41 ft
G: 10423064.20 ft
Edot: -858.5431 ft/s
Fdot: -23962.0023 ft/s
Gdot: -191.0820 ft/s
ndot/2 (drag): 0.00078002525 rev/day^2
nddt/6: 2.55211E-08 rev/day^3
Bstar: 2.35047E-04 1/Earth Radii
Elset #: 23
Rev @ Epoch: 130.25247295988

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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1080. SAREX Update 7/17 at 7:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 08:14:11 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.012.1994@ampr.org>
Source record: 27180
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.012
SAREX Update 7//17 at 7:30 UTC

Greenbelt, MD July 17, 1994 at 7:30 UTC

SAREX Schools

The school group contacts with the Space Shuttle Columbia crew are nearly complete. Twelve of the thirteen schools planned for this mission have had successful contacts. The Bair Middle School in Sunrise, Florida initiated the school group contact parade on Saturday July 9. 22 students communicated with mission commander Bob Cabana, KC5HBV. Commander Cabana has been at the mike for most of the school contacts for this flight. He has told the students to "Study hard, especially in science and math" and to "not give up." He stated further that: "I was not selected to be an astronaut on my first try, but I kept trying and that is why I am here today...so keep trying!."

In addition to the Bair School, Commander Cabana also communicated with the Sacred Hearts Academy in Honolulu, Hawaii on July 10, the Fronhofer Realschule in Ingolstadt, Germany and the Richland Elementary in Ft. Worth Texas on Monday July 11 and the Our Lady Queen of Heaven school on Tuesday July 12. KC5HBV was also at the mike during the South Seminole Middle School contact in Casselberry Florida and the Washington Elementary School District contact in Phoenix, Arizona on Wednesday July 13. On Wednesday July 14, Bob Cabana had a 3.5-4 minute chat with the students at Brentwood School in Sandersville, Georgia and the students at the West Oak High School in Westminster, South Carolina. During the West Oak contact, AM radio station WGOG broadcast the SAREX contact live. It was estimated that 10,000 people listened to this live broadcast. On Saturday July 16, the students at the Granite Mountain Middle School in Prescott, Arizona had a very early morning (5:53 am) contact with Commander Cabana. 13 students asked their questions during their pass through a SAREX telebridge in Corpus Christi, Texas. On the morning of July 15, pilot Jim Halsell answered 8 questions from an excited school group at the West Monroe High School in West Monroe, Louisiana. At the conclusion of the contact, West Monroe contact coordinator Mark Ketchell commented that as a result of the SAREX

contact it looks like there may be a new amateur radio club forming at the school. Many of the school group contacts, including the West Monroe High School, have been transmitted live via WA3NAN.

Japanese payload specialist Chiaki Mukai "Phoned Home" through SAREX on Wednesday July 13 by talking to a youth group in Japan. Despite it being a 2:03 in the morning, ten students at the Tatebayashi Children's Science Exploratorium in Gunma, Japan communicated with Dr. Mukai through the SAREX radio. All that witnessed this contact could sense the emotionally filled replies from Dr. Mukai as she answered her homeland student's questions in Japanese. When one of the students asked about the shuttle food, Dr. Mukai proudly mentioned that the STS-65 crew had a Japanese dinner the night before. The contact was shown throughout the Exploratorium on closed circuit TV. Sixty people, all Japanese media, crowded in the room where the students made contact with Dr. Mukai. This contact was covered by all the major Japanese television stations and several radio stations and newspapers. From all accounts, this contact appears to be the most comprehensive coverage given to SAREX. The SAREX Working group will share more information as we receive it.

Most of the above school groups were completed using AMSAT's telebridge system. The telebridge system is an international network of seasoned satellite ground stations that relay the communications of the astronauts from their station to the school through a phone bridge. Darome Telecommunications in Chicago donates their services to SAREX for these events. Bob Douglas, W5GEL, and Bob Diersing, N5AHD, in Texas and Dick Flagg, WH6CHU and his team in Hawaii were the SAREX team's primary telebridge ground stations for this mission.

Future SAREX operations

With nearly all the school group contacts complete, two school group backup passes have been cleared for possible general QSO opportunities. While we cannot guarantee availability, there is a high probability that the STS-65 crew will have the SAREX radio (packet or voice) operational over the continental U.S. on these passes. These opportunities include a pass on orbit 141 at MET 8 days 18 hours 45 minutes (7/17 at 11:28 UTC) and a pass that occurs around MET 9 days 18 hours 48 minutes (7/18 at 11:31 UTC). The SAREX downlink frequency is 145.55 MHz. Voice uplinks are 144.91, 144.93, 144.95, 144.97 and 144.99 (except Europe). For European hams, the voice uplinks are 144.80, 144.75 and 144.70. STS-65 voice callsigns are KC5HBV (Bob Cabana) and KC5FVF (Don Thomas). The worldwide packet

uplink frequency is 144.49. The packet radio callsign is W5RRR-1. Please note that the attitude of the shuttle orbiter provides a clear path for SAREX operations during the last half of the 8 minute period when the shuttle is above your horizon. Our school group contacts were averaging 3.5-4 minute contacts. So don't give up after the first couple of minutes after the scheduled AOS. Good Luck!!

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1081. STS-65 Rise/Set 7/17

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 08:21:58 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.013.1994@ampr.org>
Source record: 27178
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.013
STS-65 Eastern R/S Times 07/17

Below are the rise and set times for STS-65 for selected US cities
over the next two days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

New York City
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 11:33:40 11:36:59 11:39 6 D-W 141

18Jul94 10:06:08 10:09:21 10:12 6 A-E 156
18Jul94 11:41:13 11:44:23 11:47 5 D-W 157

Washington D.C.
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 09:57:52 10:01:17 10:04 6 A-E 140
17Jul94 11:32:40 11:36:24 11:39 9 D-W 141
17Jul94 13:08:14 13:11:31 13:14 6 D-W 142

18Jul94 10:05:07 10:08:42 10:11 8 A-E 156
18Jul94 11:40:12 11:43:51 11:47 9 D-W 157

Atlanta, GA
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 09:55:19 09:59:21 10:02 13 A-E 140
17Jul94 11:30:19 11:34:44 11:38 24 A-E 141
17Jul94 13:05:49 13:10:10 13:14 21 D-W 142
17Jul94 14:41:49 14:45:29 14:48 9 D-W 143

18Jul94 08:28:18 08:31:37 08:34 6 A-E 155
18Jul94 10:02:36 10:06:52 10:10 18 A-E 156
18Jul94 11:37:52 11:42:18 11:46 25 D-W 157
18Jul94 13:13:32 13:17:42 13:21 16 D-W 158

Miami, FL
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 09:55:08 09:59:47 10:03 88 A-E 140
17Jul94 11:31:00 11:35:36 11:39 43 D-W 141
17Jul94 13:06:49 13:11:28 13:15 66 D-E 142
17Jul94 14:42:39 14:47:07 14:51 28 D-W 143

18Jul94 06:53:02 06:56:23 06:59 6 A-E 154
18Jul94 08:27:15 08:31:47 08:35 35 A-E 155
18Jul94 10:02:52 10:07:29 10:11 57 A-W 156
18Jul94 11:38:46 11:43:22 11:47 44 D-E 157
18Jul94 13:14:32 13:19:10 13:23 72 D-W 158
18Jul94 14:50:35 14:54:41 14:58 14 D-W 159

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-65.014
STS-65 Central R/S Times 07/17

Below are the rise and set times for STS-65 for selected US cities
over the next two days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Chicago, IL
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

18Jul94 11:38:35 11:41:37 11:44 5 D-E 157

Huntsville, AL
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 09:55:10 09:58:57 10:02 10 A-E 140
17Jul94 11:29:57 11:34:16 11:38 20 A-E 141
17Jul94 13:05:22 13:09:39 13:13 18 D-W 142
17Jul94 14:41:20 14:44:55 14:48 8 D-W 143

18Jul94 10:02:21 10:06:27 10:10 14 A-E 156
18Jul94 11:37:28 11:41:48 11:45 21 D-W 157
18Jul94 13:13:04 13:17:10 13:20 14 D-W 158

Houston, TX
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 09:52:32 09:56:40 10:00 15 A-E 140
17Jul94 11:27:34 11:32:10 11:36 46 A-E 141
17Jul94 13:03:11 13:07:49 13:11 65 D-W 142
17Jul94 14:38:55 14:43:25 14:47 30 D-W 143
17Jul94 16:15:12 16:18:47 16:21 8 D-W 144

18Jul94 08:25:38 08:28:54 08:31 6 A-E 155
18Jul94 09:59:49 10:04:14 10:08 25 A-E 156
18Jul94 11:35:11 11:39:49 11:43 61 A-E 157
18Jul94 13:10:52 13:15:29 13:19 52 D-W 158
18Jul94 14:46:43 14:50:59 14:54 18 D-W 159

Denver, CO
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 13:02:09 13:05:42 13:08 8 D-E 142
17Jul94 14:37:31 14:40:48 14:43 6 D-W 143

18Jul94 11:34:39 11:38:03 11:40 6 A-E 157
18Jul94 13:09:35 13:13:08 13:16 8 D-W 158

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-65.15
STS-65 Western R/S Times 07/17

Below are the rise and set times for STS-65 for selected US cities
over the next two days. This data was generated to help hams without

orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

Seattle, WA
STS-65 Element Set GSFC-21

no visible passes

Albuquerque, NM
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 11:26:08 11:29:59 11:33 10 A-E 141
17Jul94 13:01:00 13:05:18 13:09 19 D-E 142
17Jul94 14:36:28 14:40:39 14:44 16 D-W 143
17Jul94 16:12:35 16:15:53 16:18 6 D-W 144

18Jul94 09:59:15 10:02:17 10:04 5 A-E 156
18Jul94 11:33:22 11:37:29 11:41 15 A-E 157
18Jul94 13:08:32 13:12:50 13:16 19 D-W 158
18Jul94 14:44:12 14:48:09 14:51 12 D-W 159

Los Angeles, CA
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 11:23:54 11:27:28 11:30 7 A-E 141
17Jul94 12:58:27 13:02:44 13:06 18 A-E 142
17Jul94 14:33:45 14:38:09 14:42 23 D-W 143
17Jul94 16:09:28 16:13:31 16:17 13 D-W 144

18Jul94 11:31:00 11:34:56 11:38 12 A-E 157
18Jul94 13:05:55 13:10:17 13:14 22 A-E 158
18Jul94 14:41:23 14:45:42 14:49 20 D-W 159
18Jul94 16:17:22 16:21:00 16:24 8 D-W 160

Honolulu, HI
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 12:48:32 12:52:52 12:56 21 A-E 142
17Jul94 14:23:55 14:28:31 14:32 50 A-W 143
17Jul94 16:00:11 16:04:29 16:08 18 A-W 144
17Jul94 17:36:19 17:40:38 17:44 18 D-E 145
17Jul94 19:12:00 19:16:37 19:20 50 D-E 146
17Jul94 20:47:50 20:52:14 20:56 21 D-W 147

18Jul94 11:21:37 11:25:01 11:27 7 A-E 157
18Jul94 12:55:54 13:00:29 13:04 50 A-E 158
18Jul94 14:31:48 14:36:16 14:40 28 A-W 159
18Jul94 16:08:07 16:12:21 16:16 17 D-W 160
18Jul94 17:44:02 17:48:28 17:52 24 D-E 161
18Jul94 19:19:41 19:24:19 19:28 70 D-W 162
18Jul94 20:56:06 20:59:48 21:03 9 D-W 163

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

SB SAREX @ AMSAT $STS-65.016
STS-65 World R/S Times 07/17

Below are the rise and set times for STS-65 for selected worldwide cities
over the next two days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note that
the times shown are UTC and NOT LOCAL TIME. This listing includes only
those passes with an elevation greater than 5 degrees. For information
regarding SAREX frequencies and operations procedures, check your
local PBBS, or bulletins from W1AW, W5RRR, W6VIO or WA3NAN.

Symbol key: rise = time that shuttle appears above horizon
tca = time of closest approach to observer
set = time that shuttle disappears below horizon
el = maximium elevation above horizon
geo = geometry: A = Ascending orbit, moving south to north
D = Descending orbit, moving north to south
E = passes east of observer
W = passes west of observer

London, England
STS-65 Element Set GSFC-21

no visible passes

Paris, France
STS-65 Element Set GSFC-21

no visible passes

Tokyo, Japan
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 18:58:16 19:02:05 19:05 10 A-E 146
17Jul94 20:33:07 20:37:22 20:41 17 D-E 147
17Jul94 22:08:36 22:12:41 22:16 14 D-W 148
17Jul94 23:44:52 23:47:53 23:50 5 D-W 149

18Jul94 17:31:21 17:34:23 17:36 5 A-E 161
18Jul94 19:05:29 19:09:34 19:13 14 A-E 162
18Jul94 20:40:40 20:44:53 20:48 17 D-W 163
18Jul94 22:16:22 22:20:10 22:23 10 D-W 164

Sydney, Australia
STS-65 Element Set GSFC-21

date rise tca set el geo orbit

17Jul94 06:09:03 06:13:04 06:16 12 D-E 137
17Jul94 07:43:56 07:48:25 07:52 23 D-E 138
17Jul94 09:19:25 09:23:51 09:27 21 A-W 139
17Jul94 10:55:22 10:59:10 11:02 9 A-W 140

18Jul94 04:42:09 04:45:20 04:48 5 D-E 152
18Jul94 06:16:16 06:20:34 06:24 17 D-E 153
18Jul94 07:51:29 07:55:59 07:59 25 A-W 154
18Jul94 09:27:07 09:31:23 09:35 16 A-W 155
18Jul94 11:03:33 11:06:37 11:09 5 A-W 156

Compiled by Dan Schultz, N8FGV
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to n8fgv@amsat.org
/EX

1082. SAREX Keps 7/17

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 13:53:36 UTC
From: ABFHB@STDVAX.GSFC.NASA.GOV
Message-ID: <$sts-65.017.1994@ampr.org>
Source record: 27177
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.017
SAREX Keps 7/17 at 13:50 UTC

Greenbelt, MD 7/17 at 13:50 UTC

At this time, the official SAREX Orbital element set for the STS-65 Space Shuttle mission is set GSFC-027a with the NORAD drag values corrected by Gil Carman, WA5NOM. This set was generated by Ron Parise, WA4SIR at the Goddard Space Flight Center. On orbit 140, predictions with this set were 2 seconds later than GSFC-025a and one second earlier than GSFC-023a. Predictions with set GSFC-021 are now 33 seconds too late because it had the Norad drag values.

STS-65
1 23173U 94039A 94197.96572968 0.00069638 00000-0 20662-3 0 276
2 23173 28.4666 305.8755 0003512 39.1990 320.8876 15.90919045 1339

Satellite: STS-65
Catalog number: 23173
Epoch time: 94197.96572968 (16 JUL 94 23:10:39.05 UTC)
Element set: GSFC-027a
Inclination: 28.4666 deg
RA of node: 305.8755 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003512 Keplerian Elements
Arg of perigee: 39.1990 deg
Mean anomaly: 320.8876 deg
Mean motion: 15.90919045 rev/day Semi-major Axis: 6677.8421 Km
Decay rate: 6.9638E-04 rev/day*2 Apogee Alt: 301.80 Km
Epoch rev: 133 Perigee Alt: 297.11 Km

NOTE - This element set is based on NORAD element set # 027.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1083. STS-65 Element Set (94197.965)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 18:00:47 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94197.965@alsys.com>
Source record: 27169
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94197.96572968 +.00069638 00000-0 20662-3 0 276
2 23173 28.4666 305.8755 0003512 39.1990 320.8876 15.90919045 1339

Satellite: STS-65
Catalog number: 23173
Epoch time: 94197.96572968 (16 JUL 94 23:10:39.05 UTC)
Element set: GSFC-027a
Inclination: 28.4666 deg
RA of node: 305.8755 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003512 Keplerian Elements
Arg of perigee: 39.1990 deg
Mean anomaly: 320.8876 deg
Mean motion: 15.90919045 rev/day Semi-major Axis: 6677.8421 Km
Decay rate: 6.9638E-04 rev/day*2 Apogee Alt: 301.80 Km
Epoch rev: 133 Perigee Alt: 297.11 Km

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1084. ANS-197 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 19:20:38 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-197.01.1994@ampr.org>
Source record: 27181
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-197.01
SSTV ON AO-13

HR AMSAT NEWS SERVICE BULLETIN 197.01 FROM AMSAT HQ
SILVER SPRING, MD JULY 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-197.01

SSTV ON OSCAR 13

Slow scanners are invited to join the SSTV sessions on AMSAT-OSCAR-13. The frequency is 145.955 MHz. The net meets at 45 minutes before Mode-S, and on Mode-B following Mode-S on Saturdays and Sundays. Join those sessions or convey your wishes for other skeds to wb6llo@amsat.org on INTERNET, and he will coordinate your efforts.

DATE TIME
23-July-1994 16:18 UTC and 18:23 UTC
24-July-1994 15:11 UTC and 17:16 UTC

/EX
SB SAT @ AMSAT $ANS-197.02
STS-65 SAREX MISSION CONTINUES

HR AMSAT NEWS SERVICE BULLETIN 197.02 FROM AMSAT HQ
SILVER SPRING, MD JULY 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-197.02

STS-65 SAREX Mission Continues

The STS-65 SAREX missions continues smoothly. The packet radio ROBOT is working perfectly and many stations are connecting and receiving their "confirming" QSO number. All radio amateurs are invited to try their hand at making a voice/packet contact with the astronauts aboard STS-65.

Monitor the WA3NAN Shuttle re-broadcast frequencies and daily ARRL bulletins to pick up the latest element sets. The following are the frequencies for the re-broadcasts:

Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland, SAREX Bulletins and Shuttle Retransmissions 3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz and 147.45 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT SAREX News Bulletins 3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz and 147.555 MHz (FM)

Also, bulletins available on INTERNET, via AMSAT News Service (ANS)
bulletins, Compuserve, and many of our local Packet Radio BSS.

The following is a summary of the frequencies that the Shuttle astronauts
will use during SAREX operations:

All operations in split mode. Do not transmit on the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks : 144.91, 144.93, 144.95, 144.97, 144.99 MHz (Except
Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Packet Freqs: Downlink: 145.55 MHz
Uplink : 144.49 MHz

Note: The crew will not favor any specific uplink frequency, so your
ability to work the crew will be the "luck of the draw."

The following is the latest keplerian element set for STS-65:

STS-65
1 23173U 94039A 94197.96572968 0.00069638 00000-0 20662-3 0 276
2 23173 28.4666 305.8755 0003512 39.1990 320.8876 15.90919045 1339

Satellite: STS-65
Catalog number: 23173
Epoch time: 94197.96572968 (16-JUL-94 23:10:39.05 UTC)
Element set: GSFC-027a
Inclination: 28.4666 deg
RA of node: 305.8755 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003512 Keplerian Elements
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Mean anomaly: 320.8876 deg
Mean motion: 15.90919045 rev/day Semi-major Axis: 6677.8421 Km
Decay rate: 6.9638E-04 rev/day*2 Apogee Alt: 301.80 Km
Epoch rev: 133 Perigee Alt: 297.11 Km

[The AMSAT News Service (ANS) would like to thank Frank Bauer and the SAREX
Working Group for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-197.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 197.03 FROM AMSAT HQ
SILVER SPRING, MD JULY 16, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-197.03

Weekly OSCAR Status Reports: 16-JUL-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30

Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
[G3RUH/DB2OS/VK5AGR]

DO-17: DO-17 still continues to transmit its voice message on a downlink frequency of 145.825 MHz.

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1085. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-17 23:12:25 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.23.001735AB@teleport.com>
Source record: 27175

In article <2vsbsu$9ve@gv-gate.gvg.tek.com> randyh@gvgadg.gvg.tek.com (Randy Hall) writes:
>From: randyh@gvgadg.gvg.tek.com (Randy Hall)
>Subject: Portable 9600 buad PacSat Station Design
>Date: 11 Jul 1994 21:00:14 GMT

>I have been thinking about what it would take to put together a portable
>9600 baud satellite station? After all, the satellite is a cube about 9"
>on a side, can we put together something about that size?

Sure, but the satellite is so small because it is counting on your system
being a lot bigger!

>My idea is to have a radio, tnc, antenna, and laptop computer that could
>be powered from a battery and used anywhere. I thought I would pose a few
>questions to the net to gather up some suggestions from those with 9600
>baud pacsat experience. I don't know if I will really put this together,
>but it is interesting to think about. I am posting this to both
>bbs@amsat.org and rec.radio.amateur.space groups.

>RADIO:
>First thought is to use one of the newer dual banders that come ready for
>9600 packet. These have the new jack on the back that connects the TNC to
>the proper stages within the radio to support 9600 baud. One of the
>problems that I see with these radios is the IF bandwidth to allow for
>Doppler shift of +/- apx 10KHz. Most of these radios tune in 5KHz steps.
>So do we have a problem with tuning needed to track Doppler with this
>style of radio? Also, the cost of these radios is rather high.

The less expensive radios you are talking about will simply not work. For 9600
baud, you MUST tune for Doppler, as well as have the RIGHT bandwidth. It takes
very little to destroy a 9600 baud packet, about 1/10th that of a 1200.

>Another idea is to use an older 25 watt 2 meter radio for the uplink. This
>radio would need to be modified to drive the vco from the TNC. These are
>pretty cheap. For the downlink, could a simple scanner work? Bruce, N4USH,
>posted a message about using a Radio Shack Pro 2006 scanner to receive
>downlinks. I have modified a scanner for APT fax use by changing out the
>IF filter with a filter of wider bandwidth. Bruce used the search mode of
>the scanner to change to a new frequency to follow the sat's Doppler
>change. The system would also probably require a preamp to help out the
>receiver. Comments on using this setup for the radios?

Same problem as above. Both are multiplied by the lack of gain of portable
antennas.

>TNC:
>There seems to be many 9600 baud G3RUH compatible TNCs on the market. I

>have seen the ads for AEA, DRSI, and others. The DRSI looks interesting as
>it draws only 40mA. Also, using a TNC that supports normal 1200 baud allows
>connection to common PBBS and users. Are any of these TNCs better or
>easier to use than others?

Wait for a couple of weeks, and the new Kantronics will be available. It will
do 9600, 1200, as well as dual simultaneous!

>ANTENNA:
>Couple of ideas here. A couple of quarter wave ground planes could be
>used. I see that several of the antenna manufacturers sell 144/440 4/5
>element beams using a common boom. MFJ sells one for around $40. One of
>these could be mounted to a camera tripod and hand tracked during the
>pass. The beamwidth of these short beams is wide, which helps to simplify
>tracking of the satellite. The antenna needs to be easy to assemble and
>disassemble to allow for easy transport.

Two of the beams might just work, possibly even one, if it was well built.
"Ground Plane" (vertical) antennas don't have nearly enough gain.

>COMPUTER:
>A portable of probably at least 386SX power with hard disk would be needed
>to run PB, PG and a tracking program. What is the minimum computer
>needed?

A 386 would do quite well for PB and PG. Avoid an SX, and be sure to get a
math coprocessor. Tracking runs S-L-O-W without it!

> The tracking program could generate an AZ/EL list before the pass
>and either print a list (if printer available) or the user could write
>these numbers down. Then during to pass the operator hand tracks the
>satellite and lets PB or PG run. Being more of a Mac person, can PB & PG run
>under Soft PC on a Mac portable?

Avoid a Mac like the plague for anything related to Amateur Radio. It may be
familiar, but when you try to run PB or PG, even the fastest emulator will
have a real hard time keeping up with 9600. I expect serial overruns aplenty.
There is a lot of Ham related software for the PC, very little for the Mac,
and an older laptop of the PC variety will run you less $$ anyway.

>BATTERY:
>A gel cell could be used to power everything. Probably something in the 12
>AH range would be needed. A solar panel could be used to charge the
>battery between passes. A power cord to connect the system into a carUs
>cigarette lighter would also be useful.

Good idea, but don't forget to factor in for a possible 2 meter amp. There is
a lot of noise on that band anymore, and the sats hear a whole lot more of it
than we do!

>So, it seems that it is possible to build a portable 9600 baud satellite
>station that would fit inside a camera bag or brief case. Has anyone put
>together such a package? Any other comments about this portable idea?

The radio would have to be something like the Icom 820H (no external amp needed) or maybe some of the older seperates if you want to tune the Doppler manually. I would be more inclined to try for the 1200 psk sats. They can definitely be worked with much smaller equipment. I have done quite a bit of investigating of all of this for a trip I plan on taking to Hawaii in my 30' sailboat. After 3 years of Packet satellite at 1200 and 9600 baud, I just don't want to be away from it!

I know of a few stations that have had good success on psk with very modest stations. The biggest thing to watch for is that the receiver needs SSB, and MUST have some sort of step system for tuning. This is usually done with microphone up-down buttons. This is needed to keep up with the Doppler, which is done automatically by the psk modem once you get it started, leaving you free to play with PB and PG.

For the antennas, the Eggbeaters look real good, and I beleive that they can be easily put away for travel. Plus, you wouldn't need to turn them! The performance would be less than optimum, and the modem would probably lose lock sometimes, but they do work.

Overall, for a modest Packet satellite station, the 9600 baud birds are too finicky. Try the 1200 ones, and there are some stations who will be glad to transfer messages for you.

>I'll compile a list of all the responses that I receive. If there is
>interest I'll post the responses.

I would be interested, to be sure, to help me in my preparation!

1086. STS-65 Orbital State Vector Rev #141

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 00:00:17 UTC
From: astroman@netcom.com
Message-ID: <astromanCt400I.8o@netcom.com>
Source record: 27172
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94198.50290753472
07/17/1994 12:04:11.211 UTC
EFG E: 19240850.29 ft
F: 9630627.33 ft
G: -4151837.30 ft
Edot: -11358.4831 ft/s
Fdot: 17940.5228 ft/s
Gdot: -11096.8834 ft/s
ndot/2 (drag): 0.00076398984 rev/day^2
nddt/6: 2.44813E-08 rev/day^3
Bstar: 2.29257E-04 1/Earth Radii
Elset #: 24
Rev @ Epoch: 141.56485740990

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1087. ARLK028 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 02:15:00 UTC
From: darryl.linkow@ledge.com
Message-ID: <cf.767.489@ledge.com>
Source record: 27176

W1>Keplerian bulletins are transmitted twice weekly from W1AW.
W1>The next scheduled transmission of these data will be Tuesday,
W1>July 19, 1994, at 2230z on Baudot and AMTOR.

Just wondering if you could tell me what software program I use
with these elements and where I get this software. Also, what
software do I use for the Space Shuttle statistics that I have seen
posted here?
Darryl Linkow KE6IHA

 OLX 2.2 Darryl Linkow (818)346-5278 9 am - 5 pm PDT

1088. VE3ONT info missed

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 03:22:17 UTC
From: galahad@ecst.csuchico.edu
Message-ID: <30csh9$m1a@charnel.ecst.CSUChico.EDU>
Source record: 27173
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

Greetings. My parents computer ate the announcement from the folks
at VE3ONT when I downloaded it (a mac, a mac, my kindom for a mac). Anyways
if anyone still has it could they repost or email it to me.

Thanks in advance.
Michael KD6PUD/AG
mpolking@kn.pacbell.com

--
Names....I got Lots of those....
Michael Douglas Polkinghorn / Michael the Bard / Galahad / or Current Resident
galahad@ecst.csuchico.edu / KD6PUD / BCSCR 736 "Witty Disclaimer"

1089. WEFAX from PYE TELECOMMUNICATIONS PT AM 10DYV Receiver?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 03:40:50 UTC
From: wwg@coutts.UUCP
Message-ID: <210@coutts.UUCP>
Source record: 27217
Cross-posted to: sci.electronics,rec.radio.amateur.space,rec.radio.amateur.misc

The issue: Can this receiver work at 137+ Mhz?

I have a PYE aircraft AM transceiver, that was modified to be a RX only unit (which is fine), using the two crystal sockets for two different receive frequencies, since the TX crystal is no longer needed.

The current crystals cause the receiver to receive 123.2 and 122.8 Mhz at the moment. I want to receive the NOAA satellite WEFAX signals on 137.5 and 137.62 Mhz using this old receiver. The crystals currently in there are in the:

(123.2 - 10.7) / 3 = 37.5 Mhz neighbourhood (this is verified).

The 137.5 Mhz freq requires a 42.26666 Mhz crystal.

The receiver details:

PYE TELECOMMUNICATIONS Model PT AM 10DYV
Serial 1944D, input 12 Volts, and has 4 tubes, of which none are required for receiving (receiver works with switch on standby, without lighting the tube filaments).

It seems a bit of a stretch to go from a 37.5 Mhz crystal to 42.266 Mhz, but there is a series connected inductor that is tunable (at least in the current rendition of its wiring -- I don't have a schematic, so I don't know if this is original or not).

I'm not sure how fussy the front end in this radio is... I doubt any serious problem there. Again with no schematic, and without having done much tracing from the antenna yet, its my opionion that there is not much "tuned circuit" to discriminate 137 Mhz from 120 Mhz.

Anybody familiar (or not) with this radio, or someone with access to its schematic wish to comment on this? I'll have to get crystal(s) made to try this, which is the reason for this post. Should I invest/waste my money on crystals for this end?

Of course, I'm assuming that NOAA signals are AM audio signals. However, if this should turn out to be FM instead-- no big deal. I can build a demod circuit after the IF section. Email preferred, thanks.

Warren W. Gay VE3WWG John Coutts Library Services Limited
wwg@coutts.UUCP Niagara Falls, Ontario, Canada
(or wwg%coutts@uunet.ca, wwg%coutts@uunet.uu.net)

1090. Re: TAPR/AMSAT DSP-93 Kit Announcement

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 05:45:59 UTC
From: gjones@tcet.unt.edu
Message-ID: <30d4un$ldg@hermes.unt.edu>
Source record: 27174

The DSP-93 text is now available on the TAPR Internet server.

Send mail to 'file-request@tapr.org'.
In the message body include: GET /pub/tapr/dsp93.txt

This will get you the complete announcement on the TAPR/AMSAT DSP-93 kit.

You can also get an entire directory of TAPR files with the DIR command.
Help is received by using HELP in the message body.

Cheers - Greg

President -- Tucson Amateur Packet Radio Corp

TAPR Office (817) 383-0000 | Internet: gjones@tenet.edu

1091. Re: Ham-Space Digest V94 #193

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 10:46:00 UTC
From: 0005018901@mcimail.COM
Message-ID: <61940718104616.0005018901PK1EM@mcimail.com>
Source record: 27182

I recently came across a program that would help to determine
true north for any location. Basically it gave the time when
the shadow cast by an object would be due north (the sun always
shines, doesn't it?). Well, of course, I lost it and can't seem
to find it. Am really too cheap to buy a compass. Anyone know of
a landline bbs where I could download this program again? Suggestions
on how to save it in the future are not necessary as I am recieving
counselling presently! Thanks de John/NS1Z 0005018901 @ mcimail.com

1092. STS-65 Orbital State Vector Rev #145

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 12:01:09 UTC
From: astroman@netcom.com
Message-ID: <astromanCt4xDy.KKp@netcom.com>
Source record: 27183
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94198.75242859954
07/17/1994 18:03:29.831 UTC
EFG E: 6583064.32 ft
F: -20708921.30 ft
G: -2817195.34 ft
Edot: 19454.7232 ft/s
Fdot: 7750.2930 ft/s
Gdot: -11646.2425 ft/s
ndot/2 (drag): 0.00076617609 rev/day^2
nddt/6: 2.46215E-08 rev/day^3
Bstar: 2.29789E-04 1/Earth Radii
Elset #: 25
Rev @ Epoch: 145.54322716647

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1093. STS-65 Element Set (94199.345)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 14:01:59 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94199.345@alsys.com>
Source record: 27184
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94199.34554466 +.00083772 00000-0 25331-3 0 366
2 23173 28.4669 295.5576 0003352 54.3064 305.7859 15.91070580 1551

Satellite: STS-65
Catalog number: 23173
Epoch time: 94199.34554466 (18 JUL 94 08:17:35.06 UTC)
Element set: GSFC-036a
Inclination: 28.4669 deg
RA of node: 295.5576 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003352 Keplerian Elements
Arg of perigee: 54.3064 deg
Mean anomaly: 305.7859 deg
Mean motion: 15.91070580 rev/day Semi-major Axis: 6677.4181 Km
Decay rate: 8.3772E-04 rev/day*2 Apogee Alt: 301.27 Km
Epoch rev: 155 Perigee Alt: 296.79 Km

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1094. Wanted NASA Courtsey Tone Info

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 16:14:06 UTC
From: ieeelib@cc.memphis.edu
Message-ID: <1994Jul18.111406.21448@msuvx2.memphis.edu>
Source record: 27185

Hi,
I am one of the control operators of the w4bs repeater system in Memphis,TN.
We are looking for the frequency and duration of the NASA courtesy tones.

We would like to change the courtesy tones of our repeaters to remember the
25th Anniversary of the first man on moon.

If anybody has info on these tones please send me a e-mail msg.

Thanks in advance,

Suresh N9GSA

___ ___ _____ Suresh Kagoo, Network Engineer, HealthSphere of America Inc.
| |__| | / ____\ / \ 5135 Covington Way #4| Domain: IEEELIB@MSUVX1.MEMPHIS.EDU
| __ | ____ \ / - \ Memphis, TN 38134 | AMPR : n9gsa@gate.n9gsa.ampr.org
|_| |_| _____/ /_/ _\ 1-800-532-3107 | AX.25 : N9GSA@W4BS.#WESTN.TN.USA

1095. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 17:32:50 UTC
From: a229aa@email.sps.mot.com
Message-ID: <a229aa-180794102803@hofbrau.sps.mot.com>
Source record: 27187

In article <n7ryw.23.001735AB@teleport.com>, n7ryw@teleport.com (William Roth) wrote:

> Avoid a Mac like the plague for anything related to Amateur Radio.

This is a really stupid thing to say...typical bias from a "PC" clone... Terry Stader posts a list every month to this newsgroup listing amateur radio software available for the Mac. There is lots of software available and a lot more on the way.

--
* Chris Terwilliger, AA7WD a229aa@email.sps.mot.com *
* Motorola AA7WD@N7MRP.AZ.USA.NA *
* Phoenix Corporate Research Labs those who forget the past *
* 2100 E. Elliot Rd. EL508 are condemned to repeat it *
* Tempe, AZ 85284 - George Santayana *

1096. Smartlevel

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 19:00:28 UTC
From: "l.h. bol" <lbol@julian.uwo.ca>
Message-ID: <Pine.3.88.9407181402.A17613-0100000@julian.uwo.ca>
Source record: 27186

While at Dayton this year I picked up a Smartelevel (microprocessor controlled level) that can communicate with a computer to give elevation information for tracking purposes (you mount it on the antenna strcuture).

The problem is that when I bought it, I was told that the information I need to interface to it and the communication protocal was commonly available on most Ham radio BBS's. I haven't been able to find anything.

Does anyone out there know what it is I'm refferring to and can point in the direction of the info I need to talk to this thing ?

Thanks in advance.

Leo

1097. Navstar GPS Constellation Status (94-07-18)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 20:34:06 UTC
From: lang@unb.ca
Message-ID: <ID8341.D940718.T172955.lang@unb.ca>
Source record: 27197
Cross-posted to: comp.infosystems.gis,rec.aviation.misc,rec.boats,rec.radio.amateur.space,rec.radio.info,sci.electronics,sci.geo.satellite-nav,sci.space.news

```
Navstar GPS Constellation Status
(94-07-18)

Blk NASA Orbit Launch
II PRN Internat. Catalog Plane Date
Seq SVN Code ID Number Pos'n (UT) Clock Available/Decommissioned
-------------------------------------------------------------------------------
Block I
01 04 1978-020A 10684 78-02-22 78-03-29 85-07-17
02 07 1978-047A 10893 78-05-13 78-07-14 81-07-16
03 06 1978-093A 11054 78-10-06 78-11-13 92-05-18
04 08 1978-112A 11141 78-12-10 79-01-08 89-10-14
05 05 1980-011A 11690 80-02-09 80-02-27 83-11-28
06 09 1980-032A 11783 80-04-26 80-05-16 91-03-06
07 81-12-18 Launch failure
08 11 1983-072A 14189 83-07-14 83-08-10 93-05-04
09 13 1984-059A 15039 84-06-13 84-07-19 94-06-20
10 12 1984-097A 15271 A-1 84-09-08 Rb 84-10-03
11 03 1985-093A 16129 85-10-09 85-10-30 94-04-13

Block II
II-1 14 14 1989-013A 19802 E-1 89-02-14 Cs 89-04-15 05:02 UT
II-2 13 02 1989-044A 20061 B-3 89-06-10 Cs 89-08-10 20:46 UT
II-3 16 16 1989-064A 20185 E-3 89-08-18 Cs 89-10-14 20:21 UT
II-4 19 19 1989-085A 20302 A-4 89-10-21 Cs 89-11-23 03:13 UT
II-5 17 17 1989-097A 20361 D-3 89-12-11 Cs 90-01-06 03:30 UT
II-6 18 18 1990-008A 20452 F-3 90-01-24 Cs 90-02-14 22:26 UT
II-7 20 20 1990-025A 20533 B-2 90-03-26 Cs 90-04-18 23:13 UT
II-8 21 21 1990-068A 20724 E-2 90-08-02 Cs 90-08-22 15:00 UT
II-9 15 15 1990-088A 20830 D-2 90-10-01 Cs 90-10-15 00:39 UT

Block IIA
II-10 23 23 1990-103A 20959 E-4 90-11-26 Cs 90-12-10 23:45 UT
II-11 24 24 1991-047A 21552 D-1 91-07-04 Rb 91-08-30 04:44 UT
II-12 25 25 1992-009A 21890 A-2 92-02-23 Cs 92-03-24 11:00 UT
II-13 28 28 1992-019A 21930 C-2 92-04-10 Cs 92-04-25 20:32 UT
II-14 26 26 1992-039A 22014 F-2 92-07-07 Cs 92-07-23 19:43 UT
II-15 27 27 1992-058A 22108 A-3 92-09-09 Cs 92-09-30 20:08 UT
II-16 32 01 1992-079A 22231 F-1 92-11-22 Cs 92-12-11 14:49 UT
II-17 29 29 1992-089A 22275 F-4 92-12-18 Cs 93-01-05 16:39 UT
II-18 22 22 1993-007A 22446 B-1 93-02-03 Cs 93-04-04 05:20 UT
II-19 31 31 1993-017A 22581 C-3 93-03-30 Cs 93-04-13 20:53 UT
II-20 37 07 1993-032A 22657 C-4 93-05-13 Cs 93-06-12 16:15 UT
```

II-21 39 09 1993-042A 22700 A-1 93-06-26 Cs 93-07-20 12:54 UT
II-22 35 05 1993-054A 22779 B-4 93-08-30 Cs 93-09-28 19:29 UT
II-23 34 04 1993-068A 22877 D-4 93-10-26 Cs 93-11-22 18:20 UT
II-24 36 06 1994-016A 23027 C-1 94-03-10 Rb 94-03-28 14:20 UT
38 To be launched on need in FY '94
33 To be launched on need in FY '94
40 To be launched on need in FY '95
30 To be launched on need in FY '95

Notes
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1. NASA Catalog Number is also known as NORAD or U.S. Space Command object number.
2. No orbital plane position = satellite no longer operational.
3. Clock: Rb = Rubidium; Cs = Cesium
4. S/A had been enabled on Block II satellites during part of 1990; S/A off between about 10 August 1990 and 1 July 1991 due to Gulf crisis; standard level re-implemented on 15 November 1991. Currently, PRN15 and PRN20 appear to have little or no S/A imposed.
5. Anti-spoofing was activated on 94-01-31 at 00:00 UT on all Block II satellites. (ref. NANU 050-94042)
6. PRN number of SVN32 was changed from 32 to 01 on 93-01-28.
7. PRN05 and PRN06 are equipped with corner-cube reflectors for satellite laser ranging (SLR). SLR tracking of the satellites will permit onboard clock errors and satellite ephemeris errors in GPS tracking to be differentiated.
8. The decommissioning date for PRN06/SVN03 is the date of termination of operations of this satellite (ref. USNO) and is about 3 weeks later than the date GPSIC gives for "deactivation".
9. The PRN06/SVN36 launch included the SEDS-2 tether experiment on the Delta II rocket body (object 23028, 1994-016B). The tether was broken by an impact on 94-03-15. The SEDS-2 end mass subsatellite and about half of the tether re-entered within a few orbits. 11 km of tether remained attached to the Delta rocket. The tether was clearly visible to the naked eye and many sightings were reported. The rocket and remaining tether re-entered on 94-05-08. (ref. Jonathan McDowell)
10. Although its L1/L2 bands were left on, PRN12 was set unusable from 94-06-17 until 94-07-08 due to power supply problems during its eclipse season. (ref. NANUs 174-94171, 181-94186, 182-94192)
11. PRN13 was boosted to a higher orbit for disposal on 94-06-20 and will not return to service. The satellite had been unusable since 94-02-27 due to "end of life testing." (ref. NANUs 083-94059 and 176-94173)

==========
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University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
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1098. ARLS027 SAREX Apollo 11 event

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 22:32:38 UTC
From: w1aw@arrl.org
Message-ID: <$arls027.1994@ampr.org>
Source record: 27190
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS027
ARLS027 SAREX Apollo 11 event

ZCZC AS71
QST de W1AW
Space Bulletin 027 ARLS027
From ARRL Headquarters
Newington, CT July 18, 1994
To all radio amateurs

SB SPACE ARL ARLS027
ARLS027 SAREX Apollo 11 event

SAREX Apollo 11 Special Event

In commemoration of the twenty-fifth anniversary of the Apollo 11 mission, the STS-65 SAREX station on board the Space Shuttle Columbia will be operated as a special event station from 1713 UTC, July 19 until 1343 UTC, July 21. Unscheduled voice contacts will be made when the crew is available.

The SAREX station joins at least 12 other amateur stations associated with the National Aeronautics and Space Administration in commemorating the landing of the Apollo Moon Lander, the Eagle, on the moon's surface in 1969. Contacts made during the event will be eligible for a special commemorative certificate. Please send your report and QSL with a large 9-inch by 12-inch self-addressed stamped-envelope to the ARRL Educational Activities Department, STS-65 Apollo Special Event, 225 Main Street, Newington, CT 06111.

SAREX operates split-frequency. The downlink, or receive frequency for all SAREX activities is 145.55 MHz. Please do not transmit on this frequency. The uplink, or transmit frequencies for voice are 144.91, 144.93, 144.95, 144.97 and 144.99 MHz. In Europe, the voice uplink frequencies are 144.70, 144.75 and 144.80 MHz. The worldwide packet uplink frequency is 144.49 MHz. Please, transmit only when the Shuttle is in range and on the air. Crew call signs for voice are Commander Robert Cabana, KC5HBV and Mission Specialist Donald Thomas, KC5FVF. The packet call sign is W5RRR-1. W5RRR is the call sign of the Johnson Space Center Amateur Radio Club which supports SAREX flight activities and hardware aboard the space shuttles.

The following Keplerian elements were provided by Gilbert Carman, WA5NOM and Ron Parise, WA4SIR for the SAREX Working Group.

STS-65
1 23173U 94039A 94199.34554466 0.00083772 00000-0 25331-3 0 366
2 23173 28.4669 295.5576 0003352 54.3064 305.7859 15.91070580 1551

Satellite: STS-65
Catalog number: 23173
Epoch time: 94199.34554466 (18 JUL 94 08:17:35.06 UTC)
Element set: GSFC-036a
Inclination: 28.4669 deg
RA of node: 295.5576 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003352 Keplerian Elements
Arg of perigee: 54.3064 deg
Mean anomaly: 305.7859 deg
Mean motion: 15.91070580 rev/day Semi-major Axis: 6677.4181 Km
Decay rate: 8.3772E-04 rev/day2 Apogee Alt: 301.27 Km
Epoch rev: 155 Perigee Alt: 296.79 Km

Note: This element set is based on NORAD element set 036. The
spacecraft has been propagated to the next ascending node, and the
orbit number has been adjusted to bring it into agreement with the
NASA numbering convention.
NNNN
/EX

1099. ARLS028 SAREX airshow contact

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 22:34:00 UTC
From: w1aw@arrl.org
Message-ID: <$arls028.1994@ampr.org>
Source record: 27191
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS028
ARLS028 SAREX airshow contact

ZCZC AS72
QST de W1AW
Space Bulletin 028 ARLS028
From ARRL Headquarters
Newington, CT July 18, 1994
To all radio amateurs

SB SPACE ARL ARLS028
ARLS028 SAREX airshow contact

SAREX Airshow Contact

Approximately 100,000 attendees at the Aerospace American annual airshow in Oklahoma City heard a 2-way Shuttle Amateur Radio EXperiment (SAREX) contact on July 17. Present at the airshow was retired three-star Air Force Lieutenant General Tom Stafford. He was patched by telephone to Commander Bob Cabana, KC5HBV on board the Space Shuttle Columbia via amateur stations WH6CJU in Hawaii, N6IZW in San Diego, CA, and W5GEL in Corpus Christi, TX. Each of the stations are part of a SAREX worldwide telebridge ground station network.

General Stafford is a former astronaut who flew aboard the Gemini 9 and Apollo 10 missions, and commanded the US/Russian Apollo-Soyuz test project. The SAREX exchange of greetings between Stafford and Cabana reflected upon the 25th anniversary of the Apollo 11 mission to the moon.

The contact was managed by Frank Bauer, KA3HDO at the Goddard Space Flight Center in Greenbelt, MD, and by Lou McFadin, W5DID and Gil Carman, WA5NOM from the SAREX Control Room at Mission Control at the Johnson Space Flight Center in Houston, TX.
NNNN
/EX

1100. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 22:34:55 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774570895@afit.af.mil>
Source record: 27189

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94199.05208333 .00002061 00000-0 46339-5 0 346
2 23173 28.4701 297.7530 0003541 49.7661 65.8230 15.91047481 1497
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1101. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 22:35:12 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774570912@afit.af.mil>
Source record: 27200
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94199.05208333 .00002061 00000-0 46339-5 0 346
2 23173 28.4701 297.7530 0003541 49.7661 65.8230 15.91047481 1497
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1102. Antenna questions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-18 22:46:44 UTC
From: Wayne_Estes@csg.mot.com
Message-ID: <9407181746.ZM13142@SALCIUS2>
Source record: 27188

I installed Az/El rotors on a tripod on my roof this weekend. Next, I plan to buy some M2 antennas: 14 el. CP yagi for VHF
30 el. CP yagi for UHF

I must use the short VHF antenna because I have light-duty rotors, and a long boom would bump into tree branches and an exhaust vent.

Can anyone answer the following questions?

1. Is it (mechanically) easy to build a phasing/relay assembly for RH/LH polarity switching on the M2 antennas?

2. Is the M2 crossboom really 10 ft. long when assembled?

3. Would a 7 ft. crossboom be long enough for VHF and UHF yagis on each end, and a future 2x3 ft. dish in the middle? (i.e. without undesired interaction between the antennas)

4. Would a preamp at the VHF yagi feedpoint distort the pattern of the antenna? Or should I mount the preamp on the mast?

5. Do some preamp models switch fast enough (PIN diodes maybe?) to allow me to transmit "through" the preamp without a timing circuit that bypasses the preamp before keying the transmitter? If so, do these preamps require a PTT line routed up to the preamp, or do they detect the RF?

Please respond to wayne@csg.mot.com, or to the newsgroup. Thanks in advance.

73 de WD5FFH (Wayne Estes, Mundelein, IL)

--
Wayne A. Estes
Motorola Asia-Pacific Cellular Subscriber Division
600 N. U.S. Hwy. 45, Rm. A-S345
Libertyville, IL 60048-1286
PHONE: 1-708-523-2386 Z-MAIL: wayne@csg.mot.com
FAX: 1-708-523-8795 POST: w10191@email.mot.com

1103. STS-65 Orbital State Vector Rev #160

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 06:33:24 UTC
From: astroman@netcom.com
Message-ID: <astromanCt6Cvo.34s@netcom.com>
Source record: 27212
Cross-posted to: rec.radio.amateur.space,rec.radio.info,sci.space.shuttle

```
Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94199.71108366898
07/18/1994 17:03:57.629 UTC
EFG E: 14777635.40 ft
F: 13316578.34 ft
G: -9193711.32 ft
Edot: -13503.9931 ft/s
Fdot: 18923.3632 ft/s
Gdot: 5732.8934 ft/s
ndot/2 (drag): 0.00077128621 rev/day^2
nddt/6: 2.49494E-08 rev/day^3
Bstar: 2.30122E-04 1/Earth Radii
Elset #: 28
Rev @ Epoch: 160.82879055078

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1104. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 13:45:12 UTC
From: wroth@netcom.com
Message-ID: <wrothCt6wvC.8ro@netcom.com>
Source record: 27195

Chris Terwilliger (a229aa@email.sps.mot.com) wrote:
: In article <n7ryw.23.001735AB@teleport.com>, n7ryw@teleport.com (William
: Roth) wrote:

: > Avoid a Mac like the plague for anything related to Amateur Radio.

: This is a really stupid thing to say...typical bias from a "PC" clone...
: Terry Stader posts a list every month to this newsgroup listing amateur
: radio software available for the Mac. There is lots of software available
: and a lot more on the way.

: --
: * Chris Terwilliger, AA7WD a229aa@email.sps.mot.com *
: * Motorola AA7WD@N7MRP.AZ.USA.NA *
: * Phoenix Corporate Research Labs those who forget the past *
: * 2100 E. Elliot Rd. EL508 are condemned to repeat it *
: * Tempe, AZ 85284 - George Santayana *

Not for communication with the pacsats there isn't, or do you know of a
mac based package that replaces the pb/pg suite? The only way I know
that you can work the pacsats using broadcast/ftl0 protocal with a mac is
with an IBM PC emulator.
--
wroth@netcom.com

1105. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 16:10:37 UTC
From: sean@g0oanint.demon.co.uk
Message-ID: <41@g0oanint.demon.co.uk>
Source record: 27213

In article <n7ryw.23.001735AB@teleport.com> n7ryw@teleport.com (William Roth) writes:
>In article <2vsbsu$9ve@gv-gate.gvg.tek.com> randyh@gvgadg.gvg.tek.com (Randy Hall) writes:
>>From: randyh@gvgadg.gvg.tek.com (Randy Hall)
>>Subject: Portable 9600 buad PacSat Station Design
>>Date: 11 Jul 1994 21:00:14 GMT
>

>> The tracking program could generate an AZ/EL list before the pass
>>and either print a list (if printer available) or the user could write
>>these numbers down. Then during to pass the operator hand tracks the
>>satellite and lets PB or PG run. Being more of a Mac person, can PB & PG run
>>under Soft PC on a Mac portable?
>
>Avoid a Mac like the plague for anything related to Amateur Radio. It may be
>familiar, but when you try to run PB or PG, even the fastest emulator will
>have a real hard time keeping up with 9600. I expect serial overruns aplenty.
>There is a lot of Ham related software for the PC, very little for the Mac,
>and an older laptop of the PC variety will run you less $$ anyway.
>

What complete and utter nonsense. For a start there are several Sat tracking programmes for the Mac at least one that I use has AZ/EL control and yes there is also a version of Broadcast for the Mac.

As to there been "very little for the Mac," I personally have about 12 meg of ham software for the Mac covering everything from Sats, DXing, TCP/IP, AX25 Packet, Grayline etc etc. One things for sure, the vast majority of it is a lot better written than most Ham PC software I've ever seen. If anyone is interested I'd be more than happy to send you a list.

While I agree with most of your reply it would seem that there are some areas were perhaps a little more home work could have been done.

Kind regards,

Sean.

1106. Lunar gravitational attraction toward satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 18:19:25 UTC
From: dbushong@wang.com
Message-ID: <Ct79KF.78q@wang.com>
Source record: 27192

I received the following two questions and have no clue what the answers are. Would anyone care to offer an opinion?

1. Does the moon's gravitational attraction exert enough force on geosynchronous satellites to cause their position to require adjustments?

2. Is there a laboratory instrument that shows/measures the attraction force between objects? If so, how does it work?

Thanks for any information you may provide, either e-mail or followup post here.

Dave, KZ1O
--
Dave Bushong, Wang Imaging

1107. Re: Antenna questions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 18:24:19 UTC
From: rel@glenqcy.glenayre.com
Message-ID: <rel.27.000C682B@glenqcy.glenayre.com>
Source record: 27214

In article <9407181746.ZM13142@SALCIUS2> Wayne_Estes@csg.mot.com (Wayne_Estes) writes:
>From: Wayne_Estes@csg.mot.com (Wayne_Estes)
>Subject: Antenna questions
>Date: 18 Jul 1994 17:46:44 -0500

>I installed Az/El rotors on a tripod on my roof this weekend. Next, I plan to
>buy some M2 antennas: 14 el. CP yagi for VHF
> 30 el. CP yagi for UHF

>I must use the short VHF antenna because I have light-duty rotors, and a long
>boom would bump into tree branches and an exhaust vent.

>Can anyone answer the following questions?

>1. Is it (mechanically) easy to build a phasing/relay assembly for RH/LH
>polarity switching on the M2 antennas?

Answering the mechanical part of the question is simply and issue of having
space on the M2 boom for a relay box and the phasing line.

Assuming that the M2 comes with a 50 Ohm phasing line for generating the RH
or LH polarization, inserting a relay should not be hard. Do you have the
information to do the phase shifting?

>2. Is the M2 crossboom really 10 ft.
long when assembled?

>3. Would a 7 ft. crossboom be long enough for VHF and UHF yagis on each end,
>and a future 2x3 ft. dish in the middle? (i.e. without undesired interaction
>between the antennas)

Yes, I have used 6 to 8 feet and have had no serious (read measureable)
problems with my set up. Set up is currently, 12 turn helix on UHF and 10
element crossed yagis on 145 MHz. Tripod mounted on 7 foot cross boom.
All homebrew by the way.

>4. Would a preamp at the VHF yagi feedpoint distort
the pattern of the>antenna? Or should I mount the preamp on the mast?

Again mounting the preamp is mostly a mechanical issue. However, you do want
to place it in the feedline before the phasing shifting relay. My preamp
is mounted in an aluminum box on the tripod and works good.

>5. Do some preamp
models switch fast enough (PIN diodes maybe?) to allow me to>transmit
"through" the preamp without a timing circuit that bypasses the>preamp before
keying the transmitter? If so, do these preamps require a PTT>line routed up
to the preamp, or do they detect the RF?

NO, please don't trust any switching method that doesn't use a timing circuit.
The cost of the preamp vs the timing circuit has no comparison.

>Please
respond to wayne@csg.mot.com, or to the newsgroup. Thanks in advance.

>73 de WD5FFH (Wayne Estes, Mundelein, IL)

>--
>Wayne A. Estes
>Motorola Asia-Pacific Cellular Subscriber Division
>600 N. U.S. Hwy. 45, Rm. A-S345
>Libertyville, IL 60048-1286
>PHONE: 1-708-523-2386 Z-MAIL: wayne@csg.mot.com
>FAX: 1-708-523-8795 POST: w10191@email.mot.com

1108. RS-10 ops for WA3NAN special event

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 19:08:19 UTC
From: "Walter K. Daniel KE3HP" <wk02593@worldlink.com>
Message-ID: <2983729368.0.wk02593@worldlink.com>
Source record: 27198

[Note: I tried sending this to amsat-bb at 1200 EDT on 19 July. I still haven't seen this in my mailbox, so perhaps amsat-bb is backed up.]

It appears that Pat Kilroy WD8LAQ and I will be operating the NASA Goddard Space Flight Center station WA3NAN for some RS-10 passes on 20 and 21 July. As you may be aware, amateur radio clubs at just about all NASA facilities are participating in the special event to commemorate the Apollo 11 landing.

The rule for frequencies for this event is 11 kHz up from the bottom of the General class portion of the subband. For RS-10, USB ops are traditionally at 29.380 MHz and up. Add 11 kHz and you'll get 29.391 MHz, our chosen downlink frequency. At the beginning of the pass, the uplink frequency will be approximately 145.8928 MHz. In the middle of the pass (no Doppler), the uplink will be approximately 145.8958 MHz. In case of other QSOs or QRM, we'll move up in frequency.

Here are three RS-10 passes we'll make sure to cover. Pat may try to cover some additional passes that occur one orbit before or after the two high-elevation passes. The following list is an OrbiTrack track for Washington, DC. Note that time is Eastern Daylight Time.

RS-10/11
Time EDT Az El Range Doppler
DOW MM/DD/YY HH:MM:SS Deg Deg km Hz

Wed 07/20/94 12:55:26 355.6 10.6 2737 3536 Rise
Wed 07/20/94 13:01:44 84.0 79.3 1020 -2 Max
Wed 07/20/94 13:08:01 170.1 10.2 2742 -3544 Set

Thu 07/21/94 11:41:07 23.0 11.2 2690 2494 Rise
Thu 07/21/94 11:45:40 71.2 22.7 2001 20 Max
Thu 07/21/94 11:50:13 119.5 11.1 2680 -2498 Set

Thu 07/21/94 13:25:39 343.0 10.5 2744 3439 Rise
Thu 07/21/94 13:31:36 272.8 52.8 1215 164 Max
Thu 07/21/94 13:37:33 194.9 11.4 2655 -3409 Set

For any contacts with WA3NAN _only_, here's QSL info: Domestic stations send a 9" by 12" self-addressed stamped envelope with $0.52 postage to the address below. Canadians need to supply $0.55US (2 IRC) while Mexicans need to supply $0.63US (2 IRC) in postage in addition to the self-addressed envelope.

The WA3NAN address: GARC, PO Box 86, Greenbelt, MD 20768-0086 USA

Please keep in mind that this info is for WA3NAN _only_; see the appropriate bulletins for QSL info for the other NASA club stations.

We'd like to thank the Goddard Amateur Radio Club for allowing us to intrude on their HF operations for these passes. We'd also like to thank GARC once again for allowing us to use their repeater for the weekly Washington-area AMSAT net. Don't forget that these are the same folks who bring you the Shuttle retransmissions!

Hope to work you through RS-10!

73, Walt KE3HP

1109. Re: Lunar gravitational attraction toward satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 19:19:45 UTC
From: mack@ncifcrf.gov
Message-ID: <Ct7CCx.DHo@ncifcrf.gov>
Source record: 27193

In article <Ct79KF.78q@wang.com> dbushong@wang.com (Dave Bushong) writes:
>
>I received the following two questions and have no clue what the
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>
>1. Does the moon's gravitational attraction exert enough force
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> adjustments?
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> force between objects? If so, how does it work?

The first method of determining G, the universal gravitation constant
(at least 100yrs ago) was by a pair of large weights joined by a horizontal
beam. The beam was suspended by a thin wire. G was determined by the twist
on the wire induced by bringing large weights into proximity to the weights
on the torsion beam.

Modern geological gravitometers measure the deflection of a
cantilevered beam in a sealed tube. The main problems there are the
large zero offset, and adjusting for temperature. Aparently the problems
aren't that large because the gravitometers bounce around in the back of
a truck along with all the other geologists tools of trade, like hammers and
explosives.

Joe Mack NA3T
mack@ncifcrf.gov

>
>Thanks for any information you may provide, either e-mail or followup
>post here.
>
>Dave, KZ1O
>--
>Dave Bushong, Wang Imaging

1110. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 19:42:47 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774646967@afit.af.mil>
Source record: 27194

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94199.58333333 .00002084 00000-0 46894-5 0 377
2 23173 28.4683 293.7797 0003699 60.1945 224.8431 15.91099607 1579
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1111. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-19 19:43:04 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774646984@afit.af.mil>
Source record: 27196
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

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2 23173 28.4683 293.7797 0003699 60.1945 224.8431 15.91099607 1579
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1112. REJECTED: Ham-Space Digest V94 #197

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 07:37:16 UTC
From: op@dg-rtp.dg.com
Message-ID: <9407200837.AG00034@rtp41.rtp.dg.com>
Source record: 27215

```
----- Mail rejected by CEO. -----
No Logical Channels Available Mail not sent to:gary rogers@dgc.ceo

----- Unsent message follows -----
From: ham-space@ucsd.edu
To: Ham-Space@ucsd.edu
Subject: Ham-Space Digest V94 #197
X-Ceo_Options: Document

CEO comments:
See document for message.

CEO document contents:

Ham-Space Digest Tue, 19 Jul 94 Volume 94 : Issue 197

Today's Topics:
Lunar gravitational attraction toward satellites? (2 msgs)
orbs$196.misc.amsat
orbs$196.oscar.amsat
RS-10 ops for WA3NAN special event
SAREX Keps 7/15
STS-65 Keps 7/14 at 15:30 UTC
STS-65 Orbital State Vector Rev #160
Two-Line Orbital Element Set: Space Shuttle (6 msgs)

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.
------------------------------------------------------------------------

Date: Tue, 19 Jul 1994 18:19:25 GMT
From:
ihnp4.ucsd.edu!usc!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!zip
.eecs.umich.edu!yeshua.marcam.com!news.kei.com!wang!dbushong@network.u
csd.edu
Subject: Lunar gravitational attraction toward satellites?
To: ham-space@ucsd.edu
```

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post here.

Dave, KZ1O
--
Dave Bushong, Wang Imaging

Date: Tue, 19 Jul 1994 19:19:45 GMT
From: ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!math.ohio-state.edu!darwin.sura.net!fc
onvx.ncifcrf.gov!mack@network.ucsd.edu
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To: ham-space@ucsd.edu

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Joe Mack NA3T
mack@ncifcrf.gov

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>Thanks for any information you may provide, either e-mail or followup

>post here.
>
>Dave, KZ1O
>--
>Dave Bushong, Wang Imaging

Date: Fri, 15 Jul 1994 09:28:00 -0600
From: ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: orbs$196.misc.amsat
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-196.M
Orbital Elements 196.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94193.24660920
Element set: 297
Inclination: 98.6491 deg
RA of node: 268.8716 deg
Eccentricity: 0.0010740
Arg of perigee: 120.3722 deg
Mean anomaly: 239.8519 deg
Mean motion: 14.28032813 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 4127
Checksum: 297

Satellite: MIR
Catalog number: 16609
Epoch time: 94194.90801470
Element set: 679
Inclination: 51.6459 deg
RA of node: 52.7244 deg
Eccentricity: 0.0003477
Arg of perigee: 143.6748 deg
Mean anomaly: 216.4466 deg
Mean motion: 15.56583481 rev/day
Decay rate: 6.924e-05 rev/day^2
Epoch rev: 48018
Checksum: 333

Satellite: HUBBLE
Catalog number: 20580

Epoch time: 94192.85852801
Element set: 505
Inclination: 28.4692 deg
RA of node: 77.4963 deg
Eccentricity: 0.0006071
Arg of perigee: 346.8534 deg
Mean anomaly: 13.1893 deg
Mean motion: 14.90638114 rev/day
Decay rate: 4.26e-06 rev/day^2
Epoch rev: 3307
Checksum: 297

Satellite: GRO
Catalog number: 21225
Epoch time: 94190.87753482
Element set: 114
Inclination: 28.4619 deg
RA of node: 74.6101 deg
Eccentricity: 0.0003465
Arg of perigee: 117.4235 deg
Mean anomaly: 242.6711 deg
Mean motion: 15.41023364 rev/day
Decay rate: 2.166e-05 rev/day^2
Epoch rev: 6044
Checksum: 264

Satellite: UARS
Catalog number: 21701
Epoch time: 94192.89558286
Element set: 554
Inclination: 56.9857 deg
RA of node: 60.0520 deg
Eccentricity: 0.0005570
Arg of perigee: 103.1912 deg
Mean anomaly: 256.9743 deg
Mean motion: 14.96455115 rev/day
Decay rate: 3.368e-05 rev/day^2
Epoch rev: 15463
Checksum: 312

/EX

Date: Fri, 15 Jul 1994 09:24:00 -0600
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: orbs$196.oscar.amsat
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-196.O
Orbital Elements 196.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94176.41110075
Element set: 289
Inclination: 27.0856 deg
RA of node: 321.0039 deg
Eccentricity: 0.6024383
Arg of perigee: 189.2195 deg
Mean anomaly: 150.8337 deg
Mean motion: 2.05882336 rev/day
Decay rate: -3.06e-06 rev/day^2
Epoch rev: 8295
Checksum: 298

Satellite: UO-11
Catalog number: 14781
Epoch time: 94195.06242397
Element set: 707
Inclination: 97.7856 deg
RA of node: 208.5283 deg
Eccentricity: 0.0011425
Arg of perigee: 178.8317 deg
Mean anomaly: 181.2912 deg
Mean motion: 14.69229240 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 55425
Checksum: 322

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94191.83829016
Element set: 925
Inclination: 82.9253 deg
RA of node: 311.3579 deg
Eccentricity: 0.0011286
Arg of perigee: 326.8723 deg
Mean anomaly: 33.1722 deg
Mean motion: 13.72339043 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 35315
Checksum: 294

Satellite: AO-13
Catalog number: 19216
Epoch time: 94194.95255508
Element set: 929
Inclination: 57.7505 deg

RA of node: 242.1137 deg
Eccentricity: 0.7218612
Arg of perigee: 345.7422 deg
Mean anomaly: 1.7891 deg
Mean motion: 2.09718797 rev/day
Decay rate: 2.98e-06 rev/day^2
Epoch rev: 4657
Checksum: 339

Satellite: FO-20
Catalog number: 20480
Epoch time: 94189.41964946
Element set: 704
Inclination: 99.0382 deg
RA of node: 337.2291 deg
Eccentricity: 0.0540391
Arg of perigee: 291.4400 deg
Mean anomaly: 62.9899 deg
Mean motion: 12.83226051 rev/day
Decay rate: -3.1e-07 rev/day^2
Epoch rev: 20685
Checksum: 311

Satellite: AO-21
Catalog number: 21087
Epoch time: 94194.16588839
Element set: 488
Inclination: 82.9469 deg
RA of node: 123.4935 deg
Eccentricity: 0.0036545
Arg of perigee: 13.7087 deg
Mean anomaly: 346.5049 deg
Mean motion: 13.74542040 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 17315
Checksum: 332

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94194.88952093
Element set: 707
Inclination: 82.9198 deg
RA of node: 351.6397 deg
Eccentricity: 0.0030785
Arg of perigee: 35.6257 deg
Mean anomaly: 324.6938 deg
Mean motion: 13.74043526 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 17231
Checksum: 338

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94188.21304092
Element set: 264
Inclination: 1.8958 deg
RA of node: 98.1428 deg
Eccentricity: 0.2918247
Arg of perigee: 185.7752 deg
Mean anomaly: 169.5951 deg
Mean motion: 1.42202950 rev/day
Decay rate: -1.16e-06 rev/day^2
Epoch rev: 148
Checksum: 305

/EX

Date: Tue, 19 Jul 94 15:08:19 -0400
From: psinntp!news.worldlink.com!usenet@uunet.uu.net
Subject: RS-10 ops for WA3NAN special event
To: ham-space@ucsd.edu

[Note: I tried sending this to amsat-bb at 1200 EDT on 19 July. I still haven't seen this in my mailbox, so perhaps amsat-bb is backed up.]

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Date: Fri, 15 Jul 1994 07:28:41 MDT
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: SAREX Keps 7/15
To: ham-space@ucsd.edu

SB SAREX @ AMSAT $STS-65.010
SAREX Keps 7/15 at 13:30 UTC

Greenbelt, MD 7/15 at 13:30 UTC

At this time, the official SAREX Orbital element set for the STS-65 Space Shuttle Mission is set GSFC-023a with the NORAD drag values corrected by Gil Carman, WA5NOM. This set was generated by Ron Parise, WA4SIR at the Goddard Space Flight Center.

STS-65
1 23173U 94039A 94196.27214970 0.00067371 00000-0 20209-3 0 230
2 23173 28.4690 318.5489 0002791 13.8590 346.2097 15.90733062 1064

Satellite: STS-65
Catalog number: 23173
Epoch time: 94196.27214970 (15 JUL 94 06:31:53.74 UTC)
Element set: GSFC-023a
Inclination: 28.4690 deg

RA of node: 318.5489 deg Space Shuttle Flight STS-65
Eccentricity: 0.0002791 Keplerian Elements
Arg of perigee: 13.8590 deg
Mean anomaly: 346.2097 deg
Mean motion: 15.90733062 rev/day Semi-major Axis: 6678.3626 Km
Decay rate: 6.7371E-04 rev/day*2 Apogee Alt: 301.84 Km
Epoch rev: 106 Perigee Alt: 298.11 Km

NOTE - This element set is based on NORAD element set # 023.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

Date: Thu, 14 Jul 1994 09:45:03 -0600
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.e
du!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@network.ucsd.edu
Subject: STS-65 Keps 7/14 at 15:30 UTC
To: ham-space@ucsd.edu

SB SAREX @ AMSAT $STS-65.009
SAREX Keps 7/14 at 15:30 UTC

Greenbelt, MD 7/14 at 15:30 UTC

At this time, the official Orbital element set for the STS-65 Space Shuttle
Mission is set GSFC-021. This set was generated by Ron Parise, WA4SIR at
the Goddard Space Flight Center.

STS-65
1 23173U 94039A 94195.26844974 0.00001893 00000-0 42328-5 0 214
2 23173 28.4698 326.0521 0003007 4.5128 355.5510 15.90636199 906

Satellite: STS-65
Catalog number: 23173
Epoch time: 94195.26844974 (14 JUL 94 06:26:34.06 UTC)
Element set: GSFC-021
Inclination: 28.4698 deg
RA of node: 326.0521 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003007 Keplerian Elements
Arg of perigee: 4.5128 deg
Mean anomaly: 355.5510 deg
Mean motion: 15.90636199 rev/day Semi-major Axis: 6678.6337 Km
Decay rate: 0.19E-04 rev/day*2 Apogee Alt: 302.25 Km
Epoch rev: 90 Perigee Alt: 298.24 Km

NOTE - This element set is based on NORAD element set # 021.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it

into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

Date: Tue, 19 Jul 1994 00:33:24 MDT
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: STS-65 Orbital State Vector Rev #160
To: ham-space@ucsd.edu

Vector format = 117
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94199.71108366898
07/18/1994 17:03:57.629 UTC
EFG E: 14777635.40 ft
F: 13316578.34 ft
G: -9193711.32 ft
Edot: -13503.9931 ft/s
Fdot: 18923.3632 ft/s
Gdot: 5732.8934 ft/s
ndot/2 (drag): 0.00077128621 rev/day^2
nddt/6: 2.49494E-08 rev/day^3
Bstar: 2.30122E-04 1/Earth Radii
Elset #: 28
Rev @ Epoch: 160.82879055078

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM

Date: Tue, 19 Jul 1994 19:42:47 GMT
From: ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!europa.eng.gtefsd.com!paladin.american.edu!zombie.ncsc.mil!blackbird.afit.af.mil!tkelso@network.ucsd.edu
Subject: Two-Line Orbital Element Set: Space Shuttle
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are
carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when
possible). Documentation and tracking software are also available on this
system. As a service to the satellite user community, the most current
elements for the current shuttle mission are provided below. The Celestial
BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using

8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation
and software are also available via anonymous ftp from archive.afit.af.mil
(129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94199.58333333 .00002084 00000-0 46894-5 0 377
2 23173 28.4683 293.7797 0003699 60.1945 224.8431 15.91099607 1579
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

Date: Tue, 19 Jul 1994 13:43:04 MDT
From: ihnp4.ucsd.edu!library.ucla.edu!news.mic.ucla.edu!unixg.ubc.ca!quartz.ucs.ualberta.c
a!alberta!usenet@network.ucsd.edu
Subject: Two-Line Orbital Element Set: Space Shuttle
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are
carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when
possible). Documentation and tracking software are also available on this
system. As a service to the satellite user community, the most current
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BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using
8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation
and software are also available via anonymous ftp from archive.afit.af.mil
(129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94199.58333333 .00002084 00000-0 46894-5 0 377
2 23173 28.4683 293.7797 0003699 60.1945 224.8431 15.91099607 1579
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

Date: Thu, 14 Jul 1994 17:35:14 MDT
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ub
c.ca!alberta!usenet@network.ucsd.edu
Subject: Two-Line Orbital Element Set: Space Shuttle
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are
carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when
possible). Documentation and tracking software are also available on this
system. As a service to the satellite user community, the most current
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BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using
8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation
and software are also available via anonymous ftp from archive.afit.af.mil
(129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94195.25000000 .00001893 00000-0 42328-5 0 217
2 23173 28.4698 326.1900 0003008 4.2858 249.9049 15.90636156 889
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

Date: Mon, 18 Jul 1994 16:35:12 MDT
From: ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umi
ch.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: Two-Line Orbital Element Set: Space Shuttle
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are
carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when
possible). Documentation and tracking software are also available on this
system. As a service to the satellite user community, the most current
elements for the current shuttle mission are provided below. The Celestial
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8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation
and software are also available via anonymous ftp from archive.afit.af.mil
(129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94199.05208333 .00002061 00000-0 46339-5 0 346
2 23173 28.4701 297.7530 0003541 49.7661 65.8230 15.91047481 1497
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

Date: Fri, 15 Jul 1994 13:12:38 MDT
From: ihnp4.ucsd.edu!galaxy.ucr.edu!library.ucla.edu!europa.eng.gtefsd.com!newsxfer.itd.um
ich.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: Two-Line Orbital Element Set: Space Shuttle
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are
carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when
possible). Documentation and tracking software are also available on this
system. As a service to the satellite user community, the most current

elements for the current shuttle mission are provided below. The Celestial
BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using
8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation
and software are also available via anonymous ftp from archive.afit.af.mil
(129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94196.25000000 .00002055 00000-0 47047-5 0 234
2 23173 28.4690 318.7145 0002792 13.5851 219.3707 15.90732990 1048
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

Date: Wed, 13 Jul 1994 15:59:57 MDT
From: ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umi
ch.edu!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@network.ucsd.edu
Subject: Two-Line Orbital Element Set: Space Shuttle
To: ham-space@ucsd.edu

The most current orbital elements from the NORAD two-line element sets are
carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when
possible). Documentation and tracking software are also available on this
system. As a service to the satellite user community, the most current
elements for the current shuttle mission are provided below. The Celestial
BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using
8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation
and software are also available via anonymous ftp from archive.afit.af.mil
(129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94194.25000000 .00002000 00000-0 45889-5 0 199
2 23173 28.4706 333.6645 0002881 354.5222 281.2916 15.90536651 726
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

Date: Tue, 19 Jul 1994 13:45:12 GMT
From: ihnp4.ucsd.edu!usc!nic-nac.CSU.net!charnel.ecst.csuchico.edu!csusac!csus.edu!netcom.
com!wroth@network.ucsd.edu
To: ham-space@ucsd.edu

References <2vsbsu$9ve@gv-gate.gvg.tek.com>, <n7ryw.23.001735AB@teleport.com>,
<a229aa-180794102803@hofbrau.sps.mot.com>oth
Subject : Re: Portable 9600 buad PacSat Station Design

Chris Terwilliger (a229aa@email.sps.mot.com) wrote:
: In article <n7ryw.23.001735AB@teleport.com>, n7ryw@teleport.com (William
: Roth) wrote:

: > Avoid a Mac like the plague for anything related to Amateur Radio.

: This is a really stupid thing to say...typical bias from a "PC" clone...
: Terry Stader posts a list every month to this newsgroup listing amateur
: radio software available for the Mac. There is lots of software available
: and a lot more on the way.

: --
: * Chris Terwilliger, AA7WD a229aa@email.sps.mot.com *
: * Motorola AA7WD@N7MRP.AZ.USA.NA *
: * Phoenix Corporate Research Labs those who forget the past *
: * 2100 E. Elliot Rd. EL508 are condemned to repeat it *
: * Tempe, AZ 85284 - George Santayana *

Not for communication with the pacsats there isn't, or do you know of a
mac based package that replaces the pb/pg suite? The only way I know
that you can work the pacsats using broadcast/ftl0 protocal with a mac is
with an IBM PC emulator.
--
wroth@netcom.com

End of Ham-Space Digest V94 #197
****

1113. REJECTED: Ham-Space Digest V94 #198

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 08:18:02 UTC
From: op@dg-rtp.dg.com
Message-ID: <9407200918.AA00033@rtp41.rtp.dg.com>
Source record: 27216
Body handling: HTML body converted to readable text

```
----- Mail rejected by CEO. -----
No Logical Channels Available Mail not sent to:gary rogers@dgc.ceo

----- Unsent message follows -----
From: ham-space@UCSD.EDU
To: Ham-Space@UCSD.EDU
Subject: Ham-Space Digest V94 #198
X-Ceo_Options: Document

CEO comments:
See document for message.

CEO document contents:

Ham-Space Digest Tue, 19 Jul 94 Volume 94 : Issue 198

Today's Topics:
* SpaceNews 18-Jul-94 *
Navstar GPS Constellation Status (94-07-18)
orbs$196.2l.amsat
orbs$196.micro.amsat
orbs$196.weath.amsat

Send Replies or notes for publication to:
Send subscription requests to:
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Fri, 15 Jul 1994 08:54:59 MDT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs
.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: * SpaceNews 18-Jul-94 *
To: ham-space@ucsd.edu

SB NEWS @ AMSAT $SPC0718
* SpaceNews 18-Jul-94 *

BID: $SPC0718

=========
SpaceNews
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MONDAY JULY 18, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* STS-65 SAREX ACTIVITY *
==========
The Space Shuttle Columbia had a flawless liftoff on 08-Jul-94 at 16:43:00.083 UTC for a 14-day mission in space. Columbia has been assigned Space Command Object Number 23173 and International Designator 1994-039 A.

The Shuttle Amateur Radio Experiment (SAREX) packet robot on board the space shuttle Columbia was activated on 11-Jul-93. The following highly edited text was copied on 12-Jul-94 at WA5ZIB from the STS-65 shuttle mission:

W5RRR-1>QST [07/12/94 17:17:00] :
Hello from KC5HBV and KC5FVF aboard the Space Shuttle Columbia
We're well into our mission now conducting materials processing and life sciences experiments that are paving the way for future operations aboard our international space station. We've talked to schools in Texas, Florida, Hawaii and Germany via SAREX and it's been great.

W5RRR-1>QRZ [07/12/94 17:17:57] :
#623-KE4HJV KE4HSB KJ5BM WD5IWT N5SEM XE2X KA5SFD KB5CXR KF7E KC6WYG WB6LLO K6EXO WA5RTL KA7FNQ KE6BVF KD6BOG N6MZV KD6NEX N7QQ N6HL N6ZHV AA6SF AB6DG WB6FJE W6US KD6VXJ W6NKF KJ9U ZS6BTD ZR3IE ZS1CM ZS6ADS N2QAC AD4HY WA4NRU

W5RRR-1>QSL [07/12/94 17:17:58] :
KB5CXR/717 PY3ADQ/662 PY3SS/647 JA1ZBM/642 7L2CAM/637 PU3VHQ/625 JA1NVB/617 JR5EBL/611 JM1QOP/588 JA2DXY/587 JF1AJE/584 JI7JRX/583 JA3CF/582 JS1MQG/580 TG9IKE/575

W5RRR-1>SAREX [07/12/94 17:17:59] :
This is STS-65 SAREX Robot station W5RRR-1
onboard the Space Shuttle Columbia.

[Info via WA5ZIB]

* GARC SHUTTLE RE-TRANSMISSIONS *
==========
The Goddard Amateur Radio Club (GARC) invites interested people to tune in to STS-65 shuttle ground communications transmissions. As a public service to the Amateur radio community, the GARC retransmits space shuttle air-to-ground communications. During the STS-65 mission which also carries a Shuttle Amateur Radio Experiment (SAREX), Amateur radio operators, shortwave listeners, and individuals with scanners can listen to these communications on the following HF (single sideband) and VHF (FM) frequencies:

3.860 MHz (LSB)
7.186 MHz (LSB)

14.295 MHz (USB)
21.395 MHz (USB)
28.650 MHz (USB)
147.450 MHz (FM) in local Washington D.C. metro area

[Info via Erich Franz Stocker, N3OXM]

* APOLLO ANNIVERSARY SPECIAL EVENTS *
====================================
At least 12 amateur stations associated with the National Aeronautics and Space Administration will be active July 19 to 22 to commemorate the 25th anniversary of humans landing on the moon, on July 20, 1969, on Apollo 11. The operations will begin at 0700 UTC July 19 and end at 0500 UTC July 22, coinciding with the time the Apollo Moon Lander (the Eagle) was on the moon's surface in 1969.

Stations are expected to be on modes including CW, SSB, FM, packet, Pactor, Amtor, RTTY, SSTV, ATV, and amateur satellites. Here are the 12 stations expected to be active:

Ames Amateur Radio Club, NASA Ames Research Center, Moffett Field, California: K6MF (AARC, Box 73, Moffett Field CA 94035-1000).

Dryden Amateur Radio Club, NASA Dryden Flight Research Center, Edwards, California: KF7GD (NASA DFRC, Attn: Dryden ARC, POB 273, Edwards CA 93523).

Goddard Amateur Radio Club, NASA Goddard Space Flight Center, Greenbelt MD: WA3NAN (GARC, PO Box 86, Greenbelt, MD 20768-0086).

Guam Contingency Landing Site Amateur Radio Group: KC4YDP/KH2 (NASA RADIO, Kennedy Space Center FL 32899).

NASA Headquarters Amateur Radio Group, Washington, DC: N4ZR (2003 Sarazen Place, Reston VA 22091-3809).

Jet Propulsion Laboratory Amateur Radio Club and Goldstone Amateur Radio Club, Jet Propulsion Laboratory, Pasadena, California: W6VIO (JPLARC, M/S 168-327, 4800 Oak Grove Dr, Pasadena, CA 91109).

Johnson Space Center Amateur Radio Club, NASA Johnson Space Center, Houston, TX: W5RRR (JSC ARC/W5RRR, Johnson Space Center, Houston TX 77058).

Kennedy Space Center Amateur Radio Group, Kennedy Space Center, Florida: KC4TCV (NASA RADIO, Kennedy Space Center FL 32899).

NASA Lewis Amateur Radio Club (NLARC), NASA Lewis Research Center, Cleveland, Ohio: AK8Y (NASA Lewis Amateur Radio Club, 21000 Brookpark Rd, MS 54-6, Cleveland OH 44135).

Marshall Amateur Radio Club, NASA Marshall Space Flight Center, Huntsville, Alabama: WA4NZD (Marshall Amateur Radio Club, CM21X, MSFC AL 35812).

Stennis Space Center Amateur Radio Club, NASA Stennis Space Center, Mississippi: K5GY (Stennis Space Center Amateur Radio Club, Bldg 1201, Stennis Space Center MS 39529).

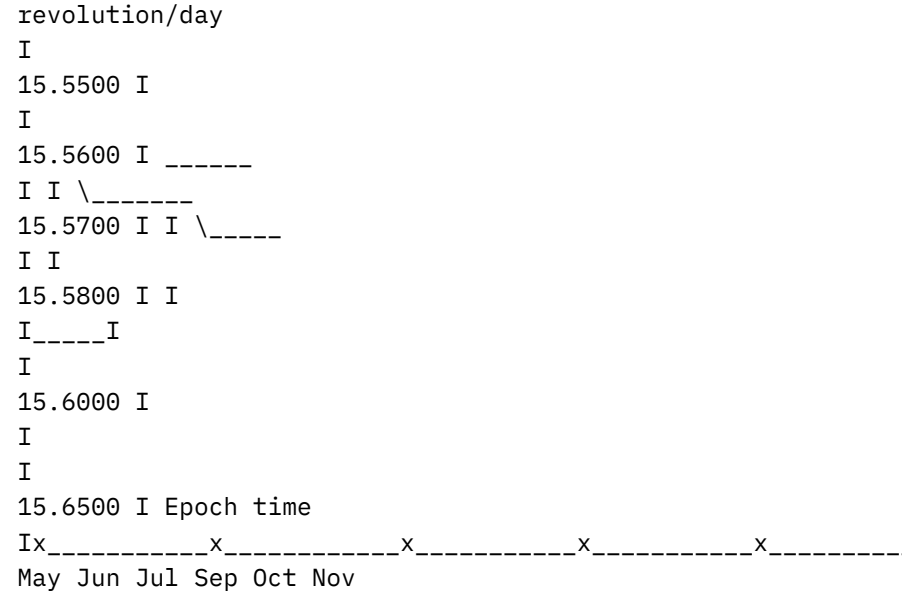
Wallops Island Amateur Radio Club, NASA Wallops Flight Facility, Wallops Island, Virginia: KE3ND (Wallops Island ARC, NASA Wallops Flight Facility, Building E-134, Wallops Island VA 23337).

White Sands Complex Amateur Radio Group, NASA White Sands Test Facility, Las Cruces, New Mexico: KF7E (P.O. Box 627, Organ NM 88052).

[Info via ARRL]

* MIR ORBIT ADJUSTMENTS *
==========
The following graphic depicts the mean motion (which is inversely proportional to mean orbital altitude) of Mir over the past several months:

TIME REVOLUTION (summary) for MIR Complex 16609
(Period= day 130 to day 185 1994)



Orbit adjustments were made on 12-March, 12-May, and on 03-July when Mir docked with the Soyuz TM-19 module.

[Info via Jean-Claude, FB1RCI]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

W9NQP Mark Butler Robert Morgan

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any

of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

Date: Mon, 18 Jul 1994 14:34:06 -0600
From:
ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.edu
!nntp.cs.ubc.ca!alberta!usenet@network.
ucsd.edu
Subject: Navstar GPS Constellation Status (94-07-18)
To: ham-space@ucsd.edu

Navstar GPS Constellation Status
(94-07-18)

Blk NASA Orbit Launch
II PRN Internat. Catalog Plane Date
Seq SVN Code ID Number Pos'n (UT) Clock Available/Decommissioned

Block I
01 04 1978-020A 10684 78-02-22 78-03-29 85-07-17
02 07 1978-047A 10893 78-05-13 78-07-14 81-07-16
03 06 1978-093A 11054 78-10-06 78-11-13 92-05-18
04 08 1978-112A 11141 78-12-10 79-01-08 89-10-14
05 05 1980-011A 11690 80-02-09 80-02-27 83-11-28
06 09 1980-032A 11783 80-04-26 80-05-16 91-03-06
07 81-12-18 Launch failure
08 11 1983-072A 14189 83-07-14 83-08-10 93-05-04
09 13 1984-059A 15039 84-06-13 84-07-19 94-06-20
10 12 1984-097A 15271 A-1 84-09-08 Rb 84-10-03
11 03 1985-093A 16129 85-10-09 85-10-30 94-04-13

Block II
II-1 14 14 1989-013A 19802 E-1 89-02-14 Cs 89-04-15 05:02 UT

II-2 13 02 1989-044A 20061 B-3 89-06-10 Cs 89-08-10 20:46 UT
II-3 16 16 1989-064A 20185 E-3 89-08-18 Cs 89-10-14 20:21 UT
II-4 19 19 1989-085A 20302 A-4 89-10-21 Cs 89-11-23 03:13 UT
II-5 17 17 1989-097A 20361 D-3 89-12-11 Cs 90-01-06 03:30 UT
II-6 18 18 1990-008A 20452 F-3 90-01-24 Cs 90-02-14 22:26 UT
II-7 20 20 1990-025A 20533 B-2 90-03-26 Cs 90-04-18 23:13 UT
II-8 21 21 1990-068A 20724 E-2 90-08-02 Cs 90-08-22 15:00 UT
II-9 15 15 1990-088A 20830 D-2 90-10-01 Cs 90-10-15 00:39 UT

Block IIA
II-10 23 23 1990-103A 20959 E-4 90-11-26 Cs 90-12-10 23:45 UT
II-11 24 24 1991-047A 21552 D-1 91-07-04 Rb 91-08-30 04:44 UT
II-12 25 25 1992-009A 21890 A-2 92-02-23 Cs 92-03-24 11:00 UT
II-13 28 28 1992-019A 21930 C-2 92-04-10 Cs 92-04-25 20:32 UT
II-14 26 26 1992-039A 22014 F-2 92-07-07 Cs 92-07-23 19:43 UT
II-15 27 27 1992-058A 22108 A-3 92-09-09 Cs 92-09-30 20:08 UT
II-16 32 01 1992-079A 22231 F-1 92-11-22 Cs 92-12-11 14:49 UT
II-17 29 29 1992-089A 22275 F-4 92-12-18 Cs 93-01-05 16:39 UT
II-18 22 22 1993-007A 22446 B-1 93-02-03 Cs 93-04-04 05:20 UT
II-19 31 31 1993-017A 22581 C-3 93-03-30 Cs 93-04-13 20:53 UT
II-20 37 07 1993-032A 22657 C-4 93-05-13 Cs 93-06-12 16:15 UT
II-21 39 09 1993-042A 22700 A-1 93-06-26 Cs 93-07-20 12:54 UT
II-22 35 05 1993-054A 22779 B-4 93-08-30 Cs 93-09-28 19:29 UT
II-23 34 04 1993-068A 22877 D-4 93-10-26 Cs 93-11-22 18:20 UT
II-24 36 06 1994-016A 23027 C-1 94-03-10 Rb 94-03-28 14:20 UT
38 To be launched on need in FY '94
33 To be launched on need in FY '94
40 To be launched on need in FY '95
30 To be launched on need in FY '95

Notes
-----
1. NASA Catalog Number is also known as NORAD or U.S. Space Command object number.
2. No orbital plane position = satellite no longer operational.
3. Clock: Rb = Rubidium; Cs = Cesium
4. S/A had been enabled on Block II satellites during part of 1990; S/A off between about 10 August 1990 and 1 July 1991 due to Gulf crisis; standard level re-implemented on 15 November 1991. Currently, PRN15 and PRN20 appear to have little or no S/A imposed.
5. Anti-spoofing was activated on 94-01-31 at 00:00 UT on all Block II satellites. (ref. NANU 050-94042)
6. PRN number of SVN32 was changed from 32 to 01 on 93-01-28.
7. PRN05 and PRN06 are equipped with corner-cube reflectors for satellite laser ranging (SLR). SLR tracking of the satellites will permit onboard clock errors and satellite ephemeris errors in GPS tracking to be differentiated.
8. The decommissioning date for PRN06/SVN03 is the date of termination of operations of this satellite (ref. USNO) and is about 3 weeks later than the date GPSIC gives for "deactivation".
9. The PRN06/SVN36 launch included the SEDS-2 tether experiment on the Delta II rocket body (object 23028, 1994-016B). The tether was broken by an impact

on 94-03-15. The SEDS-2 end mass subsatellite and about half of the tether
re-entered within a few orbits. 11 km of tether remained attached to
the Delta rocket. The tether was clearly visible to the naked eye and many
sightings were reported. The rocket and remaining tether re-entered on
94-05-08. (ref. Jonathan McDowell)
10. Although its L1/L2 bands were left on, PRN12 was set unusable from 94-06-17
until 94-07-08 due to power supply problems during its eclipse season. (ref.
NANUs 174-94171, 181-94186, 182-94192)
11. PRN13 was boosted to a higher orbit for disposal on 94-06-20 and will not
return to service. The satellite had been unusable since 94-02-27 due to
"end of life testing." (ref. NANUs 083-94059 and 176-94173)

==========
Richard B. Langley Internet: LANG@UNB.CA or SE@UNB.CA
Geodetic Research Laboratory BITnet: LANG@UNB or SE@UNB
Dept. of Geodesy and Geomatics Engineering Phone: (506) 453-5142
University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
==========

Date: Fri, 15 Jul 1994 09:29:00 -0600
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ub
c.ca!alberta!usenet@network.ucsd.edu
Subject: orbs$196.2l.amsat
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-196.N
2Line Orbital Elements 196.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94176.41110075 -.00000306 00000-0 10000-3 0 2893
2 14129 27.0856 321.0039 6024383 189.2195 150.8337 2.05882336 82954
UO-11
1 14781U 84021B 94195.06242397 .00000083 00000-0 21899-4 0 7078
2 14781 97.7856 208.5283 0011425 178.8317 181.2912 14.69229240554255
RS-10/11
1 18129U 87054A 94191.83829016 .00000023 00000-0 90572-5 0 9258
2 18129 82.9253 311.3579 0011286 326.8723 33.1722 13.72339043353150
AO-13
1 19216U 88051B 94194.95255508 .00000298 00000-0 10000-4 0 9294

```
2 19216 57.7505 242.1137 7218612 345.7422 1.7891 2.09718797 46572
FO-20
1 20480U 90013C 94189.41964946 -.00000031 00000-0 10578-4 0 7045
2 20480 99.0382 337.2291 0540391 291.4400 62.9899 12.83226051206850
AO-21
1 21087U 91006A 94194.16588839 .00000094 00000-0 82657-4 0 4887
2 21087 82.9469 123.4935 0036545 13.7087 346.5049 13.74542040173152
RS-12/13
1 21089U 91007A 94194.88952093 .00000027 00000-0 12522-4 0 7070
2 21089 82.9198 351.6397 0030785 35.6257 324.6938 13.74043526172318
ARSENE
1 22654U 93031B 94188.21304092 -.00000116 00000-0 00000 0 0 2649
2 22654 1.8958 98.1428 2918247 185.7752 169.5951 1.42202950 1486
UO-14
1 20437U 90005B 94194.18674123 .00000006 00000-0 19106-4 0 98
2 20437 98.5896 278.6106 0011733 112.1063 248.1368 14.29849139233305
AO-16
1 20439U 90005D 94191.23243034 .00000002 00000-0 17803-4 0 8070
2 20439 98.5970 276.9521 0011864 120.8244 239.4105 14.29902905232890
DO-17
1 20440U 90005E 94191.18451979 .00000008 00000-0 19944-4 0 8079
2 20440 98.5982 277.2360 0011890 119.6518 240.5849 14.30042562232905
WO-18
1 20441U 90005F 94193.67915633 .00000013 00000-0 21986-4 0 8107
2 20441 98.5990 279.7005 0012641 113.6115 246.6399 14.30016962233262
LO-19
1 20442U 90005G 94192.18636356 .00000011 00000-0 20960-4 0 8069
2 20442 98.5997 278.4886 0012869 117.3153 242.9341 14.30113219233065
UO-22
1 21575U 91050B 94194.66619103 .00000045 00000-0 29726-4 0 5113
2 21575 98.4338 268.6283 0007042 206.6952 153.3878 14.36923444156888
KO-23
1 22077U 92052B 94194.13082891 -.00000037 00000-0 10000-3 0 4063
2 22077 66.0832 225.6621 0015044 281.6382 78.2949 12.86286951 90122
AO-27
1 22825U 93061C 94193.74755536 .00000004 00000-0 19606-4 0 3046
2 22825 98.6530 269.3004 0009155 129.4928 230.7062 14.27628830 41333
IO-26
1 22826U 93061D 94192.74556263 .00000003 00000-0 18991-4 0 3047
2 22826 98.6522 268.3468 0009568 134.0785 226.1185 14.27733130 41198
KO-25
1 22830U 93061H 94193.17093563 -.00000010 00000-0 13333-4 0 3098
2 22830 98.5531 265.7524 0012396 101.6312 258.6268 14.28059498 41264
NOAA-9
1 15427U 84123A 94194.99686475 .00000084 00000-0 68552-4 0 8742
2 15427 99.0473 245.7977 0015281 141.2505 218.9765 14.13628436494046
NOAA-10
1 16969U 86073A 94194.98167710 .00000081 00000-0 53006-4 0 7716
2 16969 98.5052 203.1638 0012179 251.8027 108.1826 14.24897266406319
MET-2/17
```

```
1 18820U 88005A 94194.54056114 .00000052 00000-0 32691-4 0 3359
2 18820 82.5412 247.6202 0018062 103.4929 256.8248 13.84718542326000
MET-3/2
1 19336U 88064A 94194.22136815 .00000051 00000-0 10000-3 0 3021
2 19336 82.5413 305.2575 0016030 195.4260 164.6376 13.16967780286682
NOAA-11
1 19531U 88089A 94194.97891555 .00000075 00000-0 65024-4 0 6921
2 19531 99.1747 184.5475 0012899 57.3264 302.9149 14.13002039298929
MET-2/18
1 19851U 89018A 94191.85639551 .00000047 00000-0 29128-4 0 3021
2 19851 82.5208 125.0543 0013991 153.7603 206.4260 13.84367799270960
MET-3/3
1 20305U 89086A 94194.92403808 .00000044 00000-0 10000-3 0 894
2 20305 82.5560 251.5016 0007665 212.6308 147.4475 13.04409832226381
MET-2/19
1 20670U 90057A 94193.02564718 .00000030 00000-0 13553-4 0 8077
2 20670 82.5382 188.7333 0017853 77.2924 283.0207 13.84189830204051
FY-1/2
1 20788U 90081A 94194.03417053 -.00000082 00000-0 -26181-4 0 134
2 20788 98.8356 213.3492 0015573 302.7604 57.2060 14.01356654197320
MET-2/20
1 20826U 90086A 94192.24637361 .00000056 00000-0 37102-4 0 8153
2 20826 82.5260 126.8437 0013852 348.2605 11.8236 13.83584780191088
MET-3/4
1 21232U 91030A 94192.41447599 .00000051 00000-0 10000-3 0 7146
2 21232 82.5397 152.4638 0013853 120.2656 239.9835 13.16463320154544
NOAA-12
1 21263U 91032A 94194.99451251 .00000161 00000-0 91625-4 0 965
2 21263 98.6161 222.1803 0013093 154.5532 205.6291 14.22428011164311
MET-3/5
1 21655U 91056A 94194.19428742 .00000051 00000-0 10000-3 0 7239
2 21655 82.5532 98.3833 0013766 126.6238 233.6140 13.16831903139884
MET-2/21
1 22782U 93055A 94194.41246650 .00000037 00000-0 19902-4 0 3155
2 22782 82.5469 185.6515 0023001 148.4453 211.8095 13.83010359 43717
POSAT
1 22829U 93061G 94193.24660920 .00000013 00000-0 22747-4 0 2978
2 22829 98.6491 268.8716 0010740 120.3722 239.8519 14.28032813 41272
MIR
1 16609U 86017A 94194.90801470 .00006924 00000-0 10228-3 0 6792
2 16609 51.6459 52.7244 0003477 143.6748 216.4466 15.56583481480188
HUBBLE
1 20580U 90037B 94192.85852801 .00000426 00000-0 27230-4 0 5059
2 20580 28.4692 77.4963 0006071 346.8534 13.1893 14.90638114 33076
GRO
1 21225U 91027B 94190.87753482 .00002166 00000-0 44839-4 0 1144
2 21225 28.4619 74.6101 0003465 117.4235 242.6711 15.41023364 60440
UARS
1 21701U 91063B 94192.89558286 .00003368 00000-0 31530-3 0 5548
2 21701 56.9857 60.0520 0005570 103.1912 256.9743 14.96455115154636
```

/EX

Date: Fri, 15 Jul 1994 09:26:00 -0600
From:
ihnp4.ucsd.edu!swrinde!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.edu
!nntp.cs.ubc.ca!alberta!usenet@network.
ucsd.edu
Subject: orbs$196.micro.amsat
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-196.D
Orbital Elements 196.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94194.18674123
Element set: 9
Inclination: 98.5896 deg
RA of node: 278.6106 deg
Eccentricity: 0.0011733
Arg of perigee: 112.1063 deg
Mean anomaly: 248.1368 deg
Mean motion: 14.29849139 rev/day
Decay rate: 6.0e-08 rev/day^2
Epoch rev: 23330
Checksum: 304

Satellite: AO-16
Catalog number: 20439
Epoch time: 94191.23243034
Element set: 807
Inclination: 98.5970 deg
RA of node: 276.9521 deg
Eccentricity: 0.0011864
Arg of perigee: 120.8244 deg
Mean anomaly: 239.4105 deg
Mean motion: 14.29902905 rev/day
Decay rate: 2.0e-08 rev/day^2
Epoch rev: 23289
Checksum: 299

Satellite: DO-17
Catalog number: 20440
Epoch time: 94191.18451979
Element set: 807
Inclination: 98.5982 deg
RA of node: 277.2360 deg

Eccentricity: 0.0011890
Arg of perigee: 119.6518 deg
Mean anomaly: 240.5849 deg
Mean motion: 14.30042562 rev/day
Decay rate: 8.0e-08 rev/day^2
Epoch rev: 23290
Checksum: 314

Satellite: WO-18
Catalog number: 20441
Epoch time: 94193.67915633
Element set: 810
Inclination: 98.5990 deg
RA of node: 279.7005 deg
Eccentricity: 0.0012641
Arg of perigee: 113.6115 deg
Mean anomaly: 246.6399 deg
Mean motion: 14.30016962 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 23326
Checksum: 299

Satellite: LO-19
Catalog number: 20442
Epoch time: 94192.18636356
Element set: 806
Inclination: 98.5997 deg
RA of node: 278.4886 deg
Eccentricity: 0.0012869
Arg of perigee: 117.3153 deg
Mean anomaly: 242.9341 deg
Mean motion: 14.30113219 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 23306
Checksum: 313

Satellite: UO-22
Catalog number: 21575
Epoch time: 94194.66619103
Element set: 511
Inclination: 98.4338 deg
RA of node: 268.6283 deg
Eccentricity: 0.0007042
Arg of perigee: 206.6952 deg
Mean anomaly: 153.3878 deg
Mean motion: 14.36923444 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 15688
Checksum: 326

Satellite: KO-23
Catalog number: 22077
Epoch time: 94194.13082891
Element set: 406
Inclination: 66.0832 deg
RA of node: 225.6621 deg
Eccentricity: 0.0015044
Arg of perigee: 281.6382 deg
Mean anomaly: 78.2949 deg
Mean motion: 12.86286951 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9012
Checksum: 306

Satellite: AO-27
Catalog number: 22825
Epoch time: 94193.74755536
Element set: 304
Inclination: 98.6530 deg
RA of node: 269.3004 deg
Eccentricity: 0.0009155
Arg of perigee: 129.4928 deg
Mean anomaly: 230.7062 deg
Mean motion: 14.27628830 rev/day
Decay rate: 4.0e-08 rev/day^2
Epoch rev: 4133
Checksum: 301

Satellite: IO-26
Catalog number: 22826
Epoch time: 94192.74556263
Element set: 304
Inclination: 98.6522 deg
RA of node: 268.3468 deg
Eccentricity: 0.0009568
Arg of perigee: 134.0785 deg
Mean anomaly: 226.1185 deg
Mean motion: 14.27733130 rev/day
Decay rate: 3.0e-08 rev/day^2
Epoch rev: 4119
Checksum: 309

Satellite: KO-25
Catalog number: 22830
Epoch time: 94193.17093563
Element set: 309
Inclination: 98.5531 deg
RA of node: 265.7524 deg
Eccentricity: 0.0012396
Arg of perigee: 101.6312 deg
Mean anomaly: 258.6268 deg
Mean motion: 14.28059498 rev/day

Decay rate: -1.0e-07 rev/day^2
Epoch rev: 4126
Checksum: 304

/EX

Date: Fri, 15 Jul 1994 09:27:00 -0600
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!usenet@network.ucsd.edu
Subject: orbs$196.weath.amsat
To: ham-space@ucsd.edu

SB KEPS @ AMSAT $ORBS-196.W
Orbital Elements 196.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX July 15, 1994
BID: $ORBS-196.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94194.99686475
Element set: 874
Inclination: 99.0473 deg
RA of node: 245.7977 deg
Eccentricity: 0.0015281
Arg of perigee: 141.2505 deg
Mean anomaly: 218.9765 deg
Mean motion: 14.13628436 rev/day
Decay rate: 8.4e-07 rev/day^2
Epoch rev: 49404
Checksum: 356

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94194.98167710
Element set: 771
Inclination: 98.5052 deg
RA of node: 203.1638 deg
Eccentricity: 0.0012179
Arg of perigee: 251.8027 deg
Mean anomaly: 108.1826 deg
Mean motion: 14.24897266 rev/day
Decay rate: 8.1e-07 rev/day^2
Epoch rev: 40631
Checksum: 319

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94194.54056114
Element set: 335

Inclination: 82.5412 deg
RA of node: 247.6202 deg
Eccentricity: 0.0018062
Arg of perigee: 103.4929 deg
Mean anomaly: 256.8248 deg
Mean motion: 13.84718542 rev/day
Decay rate: 5.2e-07 rev/day^2
Epoch rev: 32600
Checksum: 290

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94194.22136815
Element set: 302
Inclination: 82.5413 deg
RA of node: 305.2575 deg
Eccentricity: 0.0016030
Arg of perigee: 195.4260 deg
Mean anomaly: 164.6376 deg
Mean motion: 13.16967780 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28668
Checksum: 302

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94194.97891555
Element set: 692
Inclination: 99.1747 deg
RA of node: 184.5475 deg
Eccentricity: 0.0012899
Arg of perigee: 57.3264 deg
Mean anomaly: 302.9149 deg
Mean motion: 14.13002039 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 29892
Checksum: 345

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94191.85639551
Element set: 302
Inclination: 82.5208 deg
RA of node: 125.0543 deg
Eccentricity: 0.0013991
Arg of perigee: 153.7603 deg
Mean anomaly: 206.4260 deg
Mean motion: 13.84367799 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 27096
Checksum: 322

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94194.92403808
Element set: 89
Inclination: 82.5560 deg
RA of node: 251.5016 deg
Eccentricity: 0.0007665
Arg of perigee: 212.6308 deg
Mean anomaly: 147.4475 deg
Mean motion: 13.04409832 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22638
Checksum: 292

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94193.02564718
Element set: 807
Inclination: 82.5382 deg
RA of node: 188.7333 deg
Eccentricity: 0.0017853
Arg of perigee: 77.2924 deg
Mean anomaly: 283.0207 deg
Mean motion: 13.84189830 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 20405
Checksum: 309

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94194.03417053
Element set: 13
Inclination: 98.8356 deg
RA of node: 213.3492 deg
Eccentricity: 0.0015573
Arg of perigee: 302.7604 deg
Mean anomaly: 57.2060 deg
Mean motion: 14.01356654 rev/day
Decay rate: -8.2e-07 rev/day^2
Epoch rev: 19732
Checksum: 287

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94192.24637361
Element set: 815
Inclination: 82.5260 deg
RA of node: 126.8437 deg
Eccentricity: 0.0013852
Arg of perigee: 348.2605 deg
Mean anomaly: 11.8236 deg
Mean motion: 13.83584780 rev/day

Decay rate: 5.6e-07 rev/day^2
Epoch rev: 19108
Checksum: 303

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94192.41447599
Element set: 714
Inclination: 82.5397 deg
RA of node: 152.4638 deg
Eccentricity: 0.0013853
Arg of perigee: 120.2656 deg
Mean anomaly: 239.9835 deg
Mean motion: 13.16463320 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15454
Checksum: 306

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94194.99451251
Element set: 96
Inclination: 98.6161 deg
RA of node: 222.1803 deg
Eccentricity: 0.0013093
Arg of perigee: 154.5532 deg
Mean anomaly: 205.6291 deg
Mean motion: 14.22428011 rev/day
Decay rate: 1.61e-06 rev/day^2
Epoch rev: 16431
Checksum: 268

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94194.19428742
Element set: 723
Inclination: 82.5532 deg
RA of node: 98.3833 deg
Eccentricity: 0.0013766
Arg of perigee: 126.6238 deg
Mean anomaly: 233.6140 deg
Mean motion: 13.16831903 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 13988
Checksum: 313

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94194.41246650
Element set: 315
Inclination: 82.5469 deg

RA of node: 185.6515 deg
Eccentricity: 0.0023001
Arg of perigee: 148.4453 deg
Mean anomaly: 211.8095 deg
Mean motion: 13.83010359 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 4371
Checksum: 285

/EX

End of Ham-Space Digest V94 #198
****

1114. STS-65 Element Set (94201.289)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 13:47:35 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94201.289@alsys.com>
Source record: 27218
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94201.28966185 +.00054802 00000-0 15851-3 0 423
2 23173 28.4662 281.0136 0003249 78.0464 282.0512 15.91226612 1864

Satellite: STS-65
Catalog number: 23173
Epoch time: 94201.28966185 (20 JUL 94 06:57:06.78 UTC)
Element set: GSFC-042a
Inclination: 28.4662 deg
RA of node: 281.0136 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003249 Keplerian Elements
Arg of perigee: 78.0464 deg
Mean anomaly: 282.0512 deg
Mean motion: 15.91226612 rev/day Semi-major Axis: 6676.9815 Km
Decay rate: 5.4802E-04 rev/day*2 Apogee Alt: 300.76 Km
Epoch rev: 186 Perigee Alt: 296.42 Km

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1115. Re: Portable 9600 baud PacSat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 13:55:31 UTC
From: CSLE87@email.mot.com
Message-ID: <CSLE87-200794095532@145.39.1.10>
Source record: 27224

In article <wrothCt6wvC.8ro@netcom.com>, wroth@netcom.com (Wayne D Roth)
wrote:

> Chris Terwilliger (a229aa@email.sps.mot.com) wrote:
> : In article <n7ryw.23.001735AB@teleport.com>, n7ryw@teleport.com (William
> : Roth) wrote:
>
> : > Avoid a Mac like the plague for anything related to Amateur Radio.
>
> : This is a really stupid thing to say...typical bias from a "PC" clone...
> : Terry Stader posts a list every month to this newsgroup listing amateur
> : radio software available for the Mac. There is lots of software available
> : and a lot more on the way.
>
> : --
> : * Chris Terwilliger, AA7WD a229aa@email.sps.mot.com *
> : * Motorola AA7WD@N7MRP.AZ.USA.NA *
> : * Phoenix Corporate Research Labs those who forget the past *
> : * 2100 E. Elliot Rd. EL508 are condemned to repeat it *
> : * Tempe, AZ 85284 - George Santayana *
>
> Not for communication with the pacsats there isn't, or do you know of a
> mac based package that replaces the pb/pg suite? The only way I know
> that you can work the pacsats using broadcast/ftl0 protocal with a mac is
> with an IBM PC emulator.
> --
> wroth@netcom.com

The PowerPC chip has invaded both the DOS and MAC sides of the fray to provide complete and total interchangability. It doesn't matter any more which hardware manufacturer you buy from, as long as there is a PPC inside (sorry, Intel!). Software, both commercial and amateur, now will finally have to stand on its own merits, not those of the hardware or OS on which it is running.

Before either or both of you get upset, let me explain that I am a dual user. My rerrible old MacSE does support both IBM and Mac disk formats, so I can take IBM HD software diskettes and translate them back to DD, which the precious blue PS/2 line can't do. When I network the two machines using MacLink, I can even convert 5 1/4 disks to 3 1/2 of any density in either OS format. The disadvantage is that I have to have two separate and distinct machines on my desk right now, which means I have precious few remaining square inches of desktop. I'll finally be able to reclaim some of that real estate if our department budget and specifically my PowerMac gets approved and fully funded!

We should also realize that most PC users don't/can't access Mac BBSs because their machines and telecom freeware libraries don't support the many functions available (and required) for Mac BBS users. Try First Class if you're serious about wanting a decent screen interface to a BBS; ANSI graphics just don't cut it in the Mac world.

--
Karl Beckman, P.E. < If this English language is so
>
Motorola LMPS.RNSG.Analog Data < precise, why do you drive on a
>
(Square waves & round corners) < parkway and park on a driveway?
>
The statements and opinions expressed here are not those of Motorola Inc.
Amateur radio WA8NVW NavyMARS NNN0VBH @
NOGBN.NOASI

1116. LES9

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 15:12:33 UTC
From: jbf@syseng1.melpar.esys.com
Message-ID: <jbf.774717153@melpar>
Source record: 27219

Anybody know the location of a satellite known as LES9? I believe it
is a geosynchronous bird.

Bruce Farquhar | "The opinions expressed are mine; nobody
jfarquhar@melpar.esys.com| else would claim them!

1117. RE: LES9

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 18:41:23 UTC
From: pchien@ids.net
Message-ID: <30kqet$neo@paperboy.ids.net>
Source record: 27226

LES 9 was built by MIT's Lincoln Labs (hence the designation Lincoln Experimental Satellite). It was launched on March 15, 1976 on a Titan IIIC launch vehicle. Weight was about 454 kgs. It was placed at 8.6 degrees west Longitude in an inclined orbit. International designation was 1976 23B, and NORAD # 8747.

I don't have any information about the satellite's mission (other than the generic communications research and experiments) or how long it operated. LES-9 was launched with its sister satellite LES-8 on the same mission.

I'm not absolutely certain (this is from memory) but I believe that the satellites were nuclear powered.

Philip Chien KC4YER

In Article <jbf.774717153@melpar>
jbf@syseng1.melpar.esys.com (J. Bruce Farquhar) writes:
>Anybody know the location of a satellite known as LES9? I believe it
>is a geosynchronous bird.
>
>
>
>Bruce Farquhar | "The opinions expressed are mine; nobody
>jfarquhar@melpar.esys.com| else would claim them!

1118. Electronic Journal of the ASA (EJASA) - July 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 21:05:20 UTC
From: klaes@mtwain.enet.dec.com
Message-ID: <30k01d$n96@nntpd.lkg.dec.com>
Source record: 27220
Cross-posted to: rec.models.rockets,rec.radio.amateur.space

THE ELECTRONIC JOURNAL OF
THE ASTRONOMICAL SOCIETY OF THE ATLANTIC

Volume 5, Number 12 - July 1994

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ASA MEMBERSHIP INFORMATION

The Electronic Journal of the Astronomical Society of the Atlantic (EJASA) is published monthly by the Astronomical Society of the Atlantic, Incorporated. The ASA is a non-profit organization dedicated to the advancement of amateur and professional astronomy and space exploration, as well as the social and educational needs of its members.

ASA membership application is open to all with an interest in astronomy and space exploration. Members receive the Journal of the ASA (the JASA is a hardcopy sent through United States Mail and is not a duplicate of this Electronic Journal) and the Astronomical League's REFLECTOR magazine. Members may also purchase discount subscriptions to ASTRONOMY and SKY & TELESCOPE magazines.

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Article submissions to the EJASA on astronomy and space exploration are most welcome. Please send your on-line articles in ASCII format to Larry Klaes, EJASA Editor, at the following net addresses or the above Society addresses:

klaes@mtwain.enet.dec.com
or - ...!decwrl!mtwain.enet.dec.com!klaes
or - klaes%mtwain.dec@decwrl.enet.dec.com
or - klaes%mtwain.enet.dec.com@uunet.uu.net

You may also use the above addresses for EJASA back issue requests, letters to the editor, and ASA membership information.

When sending your article submissions, please be certain to include a network and/or regular mail address where you can be reached, a telephone number, and a brief biographical sketch.

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THE GREAT MOON RACE: THE FINISH LINE

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I still remember that hot summer evening twenty-five years ago this month. My parents let me stay up well past my bedtime to watch the earliest historical event that I can remember. I clearly recall watching the television with the image of Mission Control fixed on the screen and listening to Walter Cronkite of CBS-TV News trying to explain to the audience the significance of the cryptic conversations taking place. For what seemed like an eternity I waited; something that any seven year-old finds difficult to do. I had watched the landing that afternoon and knew what was about to happen would be a first. However, having grown up in the Space Age with its steady diet of celestial firsts - and being only seven - I did not fully appreciate the upcoming event's significance.

Finally, just before eleven p.m. Eastern Daylight Time (EDT), the image on the TV changed and a puzzling, ghostly image appeared. At first I could not decipher what I was looking at. Then a faint human figure appeared on the screen. I quickly realized that it was an astronaut making his way down the Lunar Module (LM) ladder - but the image was upside down! After a few moments the picture righted itself. Just minutes before eleven (10:56:20 p.m. EDT, to be exact), a traveler from the planet Earth named Neil Armstrong stepped off the LM foot pad and touched the face of the Moon for the first time.

It was not too long after that I succumbed to the inevitable and fell asleep, missing the events that would follow: A second human named Edwin "Buzz" Aldrin coming down the ladder, the planting of the American flag, the gathering of lunar samples, and more. The United States had won what some at the time believed was a one-sided race to the Moon.

What happened exactly the next day I do not remember. It was just part of the now blurry mosaic of typical events in the life of any kid during a summer vacation in the late Nineteen Sixties in an ordinary New England mill town: Playing with my friends Kevin and Mike, running under the sprinkler to stay cool, building forts in the woods, staying clear of my sister's friend Diane who obviously wanted to kiss me, and occasionally wondering what third grade with Sister Bertha would be like.

Most of the estimated one billion people who watched the previous evening's events, including myself, were unaware of what was then taking place at a different mission control center deep inside the Soviet Union. A large automated spacecraft of unproven design was attempting to make its way to the lunar surface from orbit. The crash of LUNA 15 that afternoon would be just the latest in a string of failures that ultimately denied the Soviet Union their winning a significant piece of the race to the Moon.

It would be several years before I would learn of the events of that day. It would be even more years before I read about the little-known and then mostly rumored string of failures that preceded it. Only with the advent of Peristroika and the subsequent breakup of the Soviet Union in the early 1990s would the bits and pieces of the real story finally start to trickle out from behind the crumbled Iron

Curtain. Although many pieces are still missing, we in the West now know that there was indeed a race to the Moon and how the Soviets tried to either win parts of that race or at the very least upstage the American effort.

The Grand Plan

During the last year that lead up to the APOLLO 11 mission in 1969, the Soviet Union was working frantically on a three-pronged assault on the Moon. The first part of this effort was a program to send a man on a looping trajectory that would make a simple pass by the Moon and return him to Earth. The spacecraft that would perform this mission, known as the L-1, was a six-ton (5,600-kilogram) vehicle based on the SOYUZ design, whose descendant is still used today to ferry crews to and from Russia's MIR Earth-orbiting space station.

From the outside, the L-1 looked like the three-part SOYUZ but lacked its spherical orbital module. Other major differences were less obvious, including a modified propulsion system, a beefed up heat shield, long-distance communication systems, and more. The spacecraft was well-suited for its simple mission to carry a lone cosmonaut on a week-long circumlunar mission. A successful mission before the American Moon landing would allow the Soviets to claim that they were the first to send a human to the Moon.

Previous tests of the L-1 were less than successful. First they were plagued by failures of the then-new PROTON launch vehicle. The first mission to make it beyond Earth parking orbit, ZOND 4, was launched in early March of 1968. To avoid unnecessary complications, ZOND 4 was aimed directly away from the trajectory-distorting influences of the Moon and its rather lumpy gravitational field. The mission was simply to test the L-1 spacecraft at lunar distances, especially the all-important communications system.

During the six days following launch, cosmonauts in a bunker on Earth spoke to mission controllers through a relay transmitter on board the spacecraft to test these systems. Upon return from cislunar space, ZOND 4 was to make a relatively low-G, double-skip entry and land in Soviet territory. Then, just before this complicated maneuver, the probe's astro-orientation system failed, forcing the descent module to make a simple ballistic entry into Earth's atmosphere. With the quickly descending probe coming down over the Gulf of Guinea off the coast of Africa, far from any Soviet recovery ship, the spacecraft was deliberately blown up to prevent it from falling into the hands of American intelligence.

The next attempt to test the L-1 was scheduled for July 21, 1968. With the American manned lunar program on the verge of shifting into overdrive, Soviet officials needed to launch this L-1 towards the Moon in a full test of the circumlunar mission. On board were a number of biological specimens to assess the effects of exposure to the near-lunar environment, a photographic system to take high-quality

images of the lunar surface as the spacecraft passed the Moon, and, like ZOND 4, equipment to perform long-distance voice communication tests. Before the launch, a crack was discovered in the Block D escape stage of the PROTON, forcing the removal of the launch vehicle from the pad for repairs. Two months later, ZOND 5 was finally launched on September 15 and successfully sent towards the Moon.

Three days after launch, ZOND 5 made its single close pass of the Moon at a minimum distance of 1,210 miles (1,950 kilometers). Its precisely tailored trajectory then allowed the spacecraft to return to Earth without any major propulsive maneuvers. Unfortunately, failure struck just before entry into Earth's atmosphere. Again the astro-orientation system ceased to function properly and the descent module was forced to make a punishing high-G ballistic entry. This time, however, a Soviet tracking ship named the VASILY GOLOVIN was stationed under the path of ZOND 5 and was able to recover the wayward spacecraft after its splashdown in the Indian Ocean.

By this time, the Central Intelligence Agency (CIA) had informed NASA decision makers of the Soviet Union's intent to fly a manned circumlunar mission soon. With the successful Earth orbit mission of APOLLO 7 in October, the APOLLO Command and Service Modules (CSM) were deemed ready for a lunar mission. However, with the ground testing of the LM months behind schedule, there was no way for the Americans to mount a previously planned lunar orbit test of the LM to beat the Soviets. Instead, it was decided that only the CSM would be launched on a lunar orbit mission in late December. The race to be first *around* the Moon, if not actually landing on it yet, was on.

With the L-1 yet to perform successfully, Soviet engineers knew they needed at least one good end-to-end test of their circumlunar spacecraft before committing to a manned flight. The memory of the failure of SOYUZ 1 in 1967 with its then less-than-proven design and the loss of its pilot Vladimir Komarov was still fresh in the minds of everyone involved. Another test, ZOND 6, was launched on November 10. This would be the last chance to test the L-1 on its circumlunar mission and still mount a manned L-1 mission before the Americans launched APOLLO 8.

The mission of ZOND 6 was virtually identical to its predecessor. Three days after launch, the probe swung to within 1,500 miles (2,420 kilometers) of the lunar surface and began its long fall back towards Earth. Unlike the previous pair of tests, the L-1 astro-orientation system functioned properly and ZOND 6 successfully executed a double-skip entry, thus assuring a landing in Soviet territory. But the return to Earth would prove to be less than perfect. The parachute deployed prematurely and the landing capsule crashed. If it had been manned, ZOND's occupant would have been killed. While the Soviets publicly hailed the mission as a success, it was yet another blow to their lunar program.

As the December 7 launch window was approaching, a heated debate was taking place whether to commit a man to the next L-1 launch. The cosmonauts training for the mission wrote to the Politburo, stating that they were prepared to take the risk and argued that the mission would have a better chance at success with a man on board to take over in case of another automated system failure. It is rumored that a crew was chosen and that a cosmonaut would fly on this last mission before the upcoming launch of the American APOLLO 8.

After the PROTON with its L-1 was rolled out onto the pad, a series of problems with the launch vehicle arose. Before the problems could be fixed, the launch window closed and the Soviets' last chance to be first to the Moon was lost. The mission of APOLLO 8, which entered lunar orbit on Christmas Eve of 1968 with three Americans on board, was a success. American astronauts, not a Soviet cosmonaut, were the first to visit the Moon.

The following month, the now repaired launch vehicle was rolled out onto the pad for another unmanned test of the L-1. A human passenger would not be risked this time, since there was not a space first at stake any longer. The spacecraft was launched unmanned. During ascent to Earth parking orbit, the launch vehicle exploded upon ignition of the PROTON's second stage. The fact that the launch escape system also failed to operate must have sent a chill through the ranks of the cosmonauts training for the L-1 mission. If a cosmonaut was on board, he would have surely perished. While work on the L-1 circumlunar missions continued, it was realized that its passengers would not be the first to the Moon. Still, these flights would be valuable in support of the second prong of the Soviet Union's lunar assault.

The Long Shot

The second prong of the Soviet assault on the Moon was an actual manned landing on the lunar surface. During 1968, it became clear to Soviet leaders that a manned landing by a Russian cosmonaut would not occur until 1970 or 1971 at the earliest. Delays in the development of the Soviet Moon rocket, the N-1, made an earlier date unlikely. Delays in the design and testing of the Lunar Orbiter Cabin (LOK), and especially the Lunar Cabin (LK) that would make the descent to the surface, made it impossible. Nonetheless, the program schedule was pushed to the limit in hopes that the American APOLLO program might somehow falter, affording the Soviets the opportunity to overtake them in the next year or so.

The first and largest component ready for testing would be the N-1 Moon rocket itself. On November 25, 1967, a mockup of the N-1 was installed on launch pad Number 1 for seventeen days of electrical tests. The first flight-ready launch vehicle was erected on the same pad on May 7, 1968, in preparation for a test launch. The booster had to be returned to the assembly building, however, after cracks were found in the first stage structure, possibly caused by the attachment of the payload.

After months of assessment and repairs, this vehicle was again placed on the launch pad in November, only to be replaced with another mockup for further tests and launch team training. Finally, in mid-January of 1969, N-1 Number 3L was erected on the pad with its payload for its first test flight. The test would be risky since, to save time and money, the large cluster of first-stage engines was never tested as a group.

Since neither the LOK nor LK were ready for a test flight at that time, the Soviets used a modified L-1 known as the L-1S as the vehicle's primary payload. The N-1 would place the L-1S and a dummy LK on a trajectory towards the Moon. Once there, the L-1S alone would enter lunar orbit to take high-resolution photographs of proposed landing sites and then return to Earth with the exposed film. For the mission, an Orientation Engine Module (DOK) would be attached to the front of the basic L-1. The DOK would slow the L-1S enough to place it into lunar orbit, after which it would be jettisoned. The L-1S would then use its own propulsion system, located in the Instrument Module, to accelerate out of lunar orbit for the return to Earth. The spacecraft would perform a double-skip entry as in previous L-1 flights as a test of the nearly identical LOK Descent Module.

After 28 days of on-pad preparations and an additional one-day weather delay, the first N-1 lifted off into clear skies on February 21, 1969. Seconds after launch trouble began. Two of the first stage's thirty NK-33 engines shut down due to a problem with the KORD control system which guided the mammoth rocket. The launch vehicle was designed to operate with as many as four first-stage engines shut down, so the flight continued with the other engines compensating for the loss. Twenty-five seconds after launch, the engines were throttled back as programmed as the N-1 passed through maximum dynamic pressure, or max-q.

About 65 seconds into the flight, the engines were throttled back up to full power. At this point the lack of adequate testing of this Space Age leviathan became apparent. The engines throttled up more quickly than expected, causing stronger than planned vibrations. A liquid oxygen pipeline burst and started a fire in the engine compartment before the KORD could shut down the affected engine. The surrounding engines and turbopumps quickly overheated and exploded.

After seventy seconds of flight, the KORD finally shut down all engines and the launch escape system was activated. The L-1S capsule was recovered 20 to 22 miles (32 to 35 kilometers) downrange. The now powerless N-1 slammed into the Kazhak steppes and exploded some 30 miles (48 kilometers) from its launch pad.

Undeterred by this first failure, a second N-1 was modified and prepared for launch. With the successful tests of the American LM in Earth orbit during the APOLLO 9 mission in March and the test in lunar orbit by APOLLO 10 in May, only a failure of the APOLLO 11 mission and a successful N-1 test would leave the Soviets with any chance of landing a man on the Moon first.

By mid-1969, the second N-1 launch pad was ready and a mockup installed for fitting and electrical tests. Finally, on July 3, the second N-1, Number 5L, took off from pad Number 1 with another L-1S as its primary payload. It immediately encountered problems when debris in the oxidizer tank was ingested by one of the first-stage engines, causing its turbopump to explode. This explosion caused a second engine to fail, which in turn caused a chain reaction, eliminating several neighboring engines as well as damaging the KORD's electrical control system.

The launch escape system was automatically activated, pulling yet another L-1S descent module away from an N-1. The capsule came down about one-half mile (one kilometer) from the pad, while the fully fueled N-1 crashed into its launch pad eighteen seconds after launch. The impact destroyed the rocket, pad Number 1, and heavily damaged the newly completed pad Number 2.

The N-1 was in desperate need of modification. Almost two years of launch pad reconstruction would be needed before the Moon rocket could be flown again. With their hopes to beat the Americans to a manned Moon landing surely dashed, the Soviets had only one last card to play.

The Ace in the Hole

The last prong of the Soviets' plan to beat the Americans to the Moon did not involve a manned spacecraft at all. As part of a long-term plan to explore the Moon, designers at the Babakin Design Bureau had come up with plans for unmanned lunar landers, rovers, and orbiters somewhat similar in size and mission to the long-abandoned American PROSPECTOR program. The exact origin and original mission for this family of spacecraft is still unknown, but it was likely meant to be used as a manned mission pathfinder.

At this point in history, though, one of the proposed missions could have been to undermine the scientific justification for the manned APOLLO missions. By March of 1969, the Soviets publicly admitted to planning an unmanned lunar sample return mission. The major selling point of this program was that an unmanned spacecraft could return samples of the lunar surface for a fraction of the cost of a manned mission and at no risk to a human crew. It would be a major coup if the Soviets could do this before an American manned landing and could totally undermine political support in America for any manned lunar mission if one of the early APOLLO test missions or the first manned landing attempt had failed.

With the real possibility of stealing some of APOLLO's thunder, the first launch of this six-ton (5,700-kilogram) sample return spacecraft took place on April 15, 1969. It never got far since its PROTON booster was rumored to have exploded on the launch pad. A second attempt on June 14 made it as far as the ignition of the PROTON's second-stage, at which point it exploded.

Since March, tensions between the Soviets and Chinese had erupted almost to the point of war, with several skirmishes taking place along their common border. During this time an unusually large number of Soviet photoreconnaissance satellites were launched to observe Chinese troop movements. With this heightened sense of alert, one cannot help but wonder if such 'unimportant' flights as a lunar mission got the short end of the stick when it came to obtaining resources for launch preparations.

There was only one last chance to beat the Americans and get samples of the Moon back to Earth before the APOLLO 11 mission. On July 13, 1969, just three days before the launch of APOLLO 11, LUNA 15 went into a trajectory towards the Moon. After a trajectory correction maneuver the day after launch, LUNA 15 fired its rockets again on July 17, entering a 34 by 126-mile (55 by 203-kilometer) lunar orbit with APOLLO 11 just two days behind it. On the day APOLLO 11 entered lunar orbit, LUNA 15 altered its orbit to 5.6 by 137 miles (9 by 203 kilometers), inclined 126 degrees to the lunar equator. At this point there were worries in the U.S. that LUNA 15 would somehow interfere with the manned APOLLO mission. Assurances were quickly given by the Soviets that this would not be the case and both missions continued.

On July 20, only hours before the scheduled landing of APOLLO 11, LUNA 15 made yet another orbital change, resulting in a 10 by 68-mile (16 by 110-kilometer) orbit inclined 127 degrees. It was not until the next day, after astronauts Neil Armstrong and Edwin Aldrin had already landed their Lunar Module named EAGLE on Mare Tranquilitas - the Sea of Tranquility - and walked on the Moon, that LUNA 15 made its last retrorocket burn and began its descent to the lunar surface. Unfortunately, the lander crashed at a speed of 300 miles per hour (480 kilometers per hour) at 17 degrees north, 60 degrees east in Mare Crisium, the Sea of Crises. The Soviets simply announced that LUNA 15 had completed its mission and left it at that. It would be almost twenty years before it was officially admitted that LUNA 15 was a failed sample return attempt.

Even if LUNA 15 had succeeded at this landing attempt, it would not have returned until the day after the return of APOLLO 11 on July 24. This mission did spend one day longer in lunar orbit than was typical of later sample missions, making it possible that there were some problems with the spacecraft or tracking it or accurately predicting its orbit. If LUNA 15 had made it down in three days instead of four, or if the APOLLO 11 mission had failed to return samples, the Soviets would have had their space first. Instead, the Soviets had several tons of wreckage on the lunar surface and at best a brief blurb in Western newspapers buried several pages behind the news of the successful mission of APOLLO 11.

Postscript

Even after the failure to beat the Americans to the Moon, the Soviets continued through 1969 with their lunar missions. On August

8, 1969, the Soviets successfully launched an L-1 spacecraft on another unmanned circumlunar flight. ZOND 7 flew by the Moon, coming to within 1,200 miles (2,000 kilometers) of the surface three days after launch. On August 14 the latest L-1's descent module executed a perfect entry and landing, making it the first totally successful flight of the L-1 design.

Plans at that time called for another unmanned flight in December. The first manned L-1 circumlunar flight would then be launched in April of 1970 to coincide with the one hundredth anniversary of the birth of Vladimir Ilyich Lenin (1870-1924), the leader of the Russian Revolution in 1917. Electrical tests of the last unmanned L-1 spacecraft took place between September and November of 1969, but the L-1 manned program was postponed and finally scrapped, possibly because of the success of the second American lunar landing, APOLLO 12, in November.

Sample return mission attempts also continued in 1969, but with less success. A mission launched on September 23 got stranded in its Earth parking orbit when the PROTON's Block D escape stage failed to operate properly. This attempt received the generic Soviet moniker of KOSMOS 300. Another attempt launched on October 22 suffered a similar fate and was designated KOSMOS 305 after it failed to leave Earth orbit. Unlike the L-1 program, however, the Soviets would continue with their unmanned lunar program into 1970 and beyond, advertising it as the preferred, cheaper, and safer means to explore the Moon. It was hoped that 1970 would be luckier for the Soviets than the previous two years.

Summary of Lunar Missions: Second Half 1968 to 1969

Name Launch Country Weight Launch Vehicle
Date lbs (kg)

ZOND 5 Sep 14, 1968 USSR 12,300 (5600) ? PROTON
Partially successful unmanned L-1 circumlunar test

ZOND 6 Nov 10, 1968 USSR 12,300 (5600) ? PROTON
Partially successful unmanned L-1 circumlunar test

APOLLO 8 Dec 21, 1968 US 63,631 (28,897) SATURN V
First manned lunar orbiter

(Unannounced) Jan 19, 1969 ? USSR 12,300 (5600) ? PROTON
Possible launch failure of unmanned L-1 circumlunar test

(Unannounced) Feb 21, 1969 USSR 15,000 (7000) ? N-1
Unsuccessful test of N-1 carrying L-1S photographic lunar orbiter

(Unannounced) Apr 15, 1969 USSR 12,600 (5700) ? PROTON
Launch failure of sample return attempt

APOLLO 10 May 18, 1969 US 94,325 (42,836) SATURN V
Second manned lunar orbiter and test of LM

(Unannounced) Jun 14, 1969 USSR 12,600 (5700) ? PROTON
Launch failure of sample return attempt

(Unannounced) Jul 3, 1969 USSR 15,000 (7000) ? N-1
Unsuccessful test of N-1 carrying L-1S photographic
lunar orbiter

LUNA 15 Jul 13, 1969 USSR 12,600 (5700) ? PROTON
Unsuccessful lunar sample return attempt

APOLLO 11 Jul 16, 1969 US 96,584 (43,862) SATURN V
First manned lunar landing

ZOND 7 Aug 7, 1969 USSR 12,300 (5600) ? PROTON
Unmanned L-1 circumlunar test

KOSMOS 300 Sep 23, 1969 USSR 12,600 (5700) ? PROTON
Unsuccessful lunar sample return attempt

KOSMOS 305 Oct 22, 1969 USSR 12,600 (5700) ? PROTON
Unsuccessful lunar sample return attempt

APOLLO 12 Nov 14, 1969 US 96,681 (43,906) SATURN V
Second manned lunar landing

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About the Author -

Andrew J. LePage is a scientist at a small R&D company in the Boston, Massachusetts area involved in space science image and data analysis. He has written many articles on the history of spaceflight and astronomy over the past few years that have been published in many magazines throughout North America and Europe. Andrew has been a serious observer of the Soviet/CIS space program for over one dozen years.

Andrew's Internet address is: lepage@bur.visidyne.com

Andrew is the author of the following EJASA articles:

"Mars 1994" - March 1990
"The Great Moon Race: The Soviet Story, Part One" - December 1990
"The Great Moon Race: The Soviet Story, Part Two" - January 1991
"The Mystery of ZOND 2" - April 1991
"The Great Moon Race: New Findings" - May 1991
"The Great Moon Race: In the Beginning..." - May 1992
"The Great Moon Race: The Commitment" - August 1992
"The Great Moon Race: The Long Road to Success" - September 1992
"Recent Soviet Lunar and Planetary Program Revelations" - May 1993
"The Great Moon Race: The Red Moon" - July 1993
"The Great Moon Race: The Tide Turns" - August 1993
"The Great Moon Race: The Final Lap - November 1993
"A Personal Adventure in Home Computing: The Origin of Comet Shoemaker-Levy 9" - March 1994

THE ELECTRONIC JOURNAL OF THE ASTRONOMICAL SOCIETY OF THE ATLANTIC

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1119. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 21:10:06 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774738606@afit.af.mil>
Source record: 27222

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94200.91666667 .00002073 00000-0 46300-5 0 411
2 23173 28.4671 283.8025 0003613 71.6908 307.1635 15.91200958 1790
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1120. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 21:10:23 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774738623@afit.af.mil>
Source record: 27240
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94200.91666667 .00002073 00000-0 46300-5 0 411
2 23173 28.4671 283.8025 0003613 71.6908 307.1635 15.91200958 1790
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1121. Downlink signal

Newsgroup: rec.radio.amateur.space
Date: 1994-07-20 23:45:38 UTC
From: Gary_Rogers@DGC.ceo.dg.COM
Message-ID: <9407210045.AK00034@rtp41.rtp.dg.com>
Source record: 27221

Message:
Does anyone have any ideas about a problem I seem to have? My
downlink signals seem to have a buzz as if there was bad filtering in
the power supply of my transmitter. Last night I had a local ham
meet me on 144.200 and he says the signal sounds fine. The equipment
here is an IC-251A and Mirage amp for uplink and an TS-690S for
recieve. The noise is there whether the amp is on or not. I noticed
the same thing on the FO-20 downlink yesterday but didn't hear it
today, so it isn't the reciever. The problem originally came up when
operating RS-10. Any ideas or other input welcome.

Thanks in advance.

Gary WA4YMZ Gary Rogers@dgc.ceo.dg.com

The opinions I express are mine alone. Data General doesn't want them
and I change them from time to time anyway.

1122. CONNECTING THREE MODEMS

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 00:17:40 UTC
From: Gary_Rogers@DGC.ceo.dg.COM
Message-ID: <9407210117.AC00038@rtp41.rtp.dg.com>
Source record: 27223

Message:
I'm cross-posting to Digital and Space because my questions concern both, so a lot of people will see this twice.

I recently purchased a PacComm PSK-1 satellite modem and last Saturday I purchased the PacComm TNC-NB96 (to celebrate getting my Advanced and passing the Extra written cold, but that's another story). Now I have to figure how to connect everything together. My primary use will be the satellites, both PSK and 9600 FM, but I'm sure I'll do some local stuff, too, now that I'm equiped. The 2M rig is an old Icom IC-251A and the satellite receiver is a Down East Microwave transverter/Kenwood TS-670 combination. Reading through the literature, it looks like I'll be making a LOT of connections. If anyone has any experience with a similar setup or can offer suggestions, please pass them along. What I need to know are things like: 1) Will I have to have separate taps for xmit and rcv for each mode? 2) Can I use some sort of switch box or relay scheme to route the signals or will I be constantly plugging and unplugging? 3) Can I use my direct connections for 9600 FSK for 1200 AFSK? Has anyone else got experience with the PacComm setup? Any suggestions for a good terminal program? Please post here. Thanks in advance. Gary WA4YMZ

1123. Eggbeaters.

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 03:15:05 UTC
From: XTL00014@DUVM.OCS.DREXEL.EDU
Message-ID: <30kp7p$d0q@dunx1.ocs.drexel.edu>
Source record: 27225

Hello. I am speaking on behalf of Central High School, Philadelphia.
We recently recieved a $1000 for Satellite communications.
We have nothing to start with (SCRATCH!). Do you know how good
Eggbeater antennas are?
73 es TNX de N3RCS, Adam, class of 255, xtl00014@duvm.ocs.drexel.edu

Oh yeah. We will accept ANY donation of amateur equiptment! (Tax
deductable!)

1124. Re: LES9

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 08:49:14 UTC
From: brent@network.ucsd.edu
Message-ID: <30lcqa$gl5@network.ucsd.edu>
Source record: 27227

In article <jbf.774717153@melpar> jbf@syseng1.melpar.esys.com (J. Bruce Farquhar) writes:
>Anybody know the location of a satellite known as LES9? I believe it
>is a geosynchronous bird.

Yes, it is a geosync, inclined almost 17 degrees, and sitting at about
106 degrees west.

LES 9
1 08747U 76023B 94200.91591465 -.00000102 00000-0 10000-3 0 6400
2 08747 16.6115 283.7785 0024551 111.5271 126.9263 1.00271924 12809

It's operating in the wide band mode at the moment, and you will find
the telemetry at 249.360

Occasionally you'll hear some weekend warriers on it, but other than
that, just some data and the BPSK signals from here.

Brent Jones
Amundsen-Scott South Pole Station
90 Degrees South,
Antarctica

1125. test

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 10:44:16 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940721104416@ken_durham.sc.ti.com>
Source record: 27231

```
testing return address
```

1126. Hamcom22 program problem

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 10:57:46 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940721105746@ken_durham.sc.ti.com>
Source record: 27232

Hamcom20 and Hamcom22 (which were downloaded from a bulletin board) don't seem to recognize data at the com port. The op-amp interface used works ok with Hffax and is the same as the one described in the txt file for Hamcom. There is no signal on the tuning scope display. No port designation or definition in the config file seems to help.

Does anyone have a working Hamcom program? I would like to be able to use this to copy the RTTY from AO-13 rfor the schedule information.

Any ideas?

Thanks, Ken K5MBV 214-997-3434

1127. Re: KLM vs. M2 antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 12:47:00 UTC
From: "Colin R. Wright" <lifeform@delphi.com>
Message-ID: <Jqzzy50.lifeform@delphi.com>
Source record: 27228

My experience was that the Cushcraft AOP-1 set stayed on my roof for about a week before I turned around and bought the KLM 22-ele 2M and 40-ele 70cm antennae, as well as their fiberglass crossboom. I have to agree with Gary and others who say to do it right the first time

1128. STS-65 Packet Metabeacons from the Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 12:52:43 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-65.018.1994@ampr.org>
Source record: 27236
Cross-posted to: rec.radio.amateur.space,rec.radio.info
Body handling: HTML body converted to readable text

SB SAREX @ AMSAT $STS-65.018
Packet Metabeacons from Shuttle

Greenbelt, MD July 21, 1994 at 12:30 UTC

The following is a compilation of some of the packet radio metabeacons copied from the crew on the Space Shuttle Columbia. These were provided by Gil Carman, WA5NOM, and Andy MacAllister, WA5ZIB. The SAREX working group would like to extend its thanks all of you who have provided us feedback and downlink updates of the packet system during the STS-65 mission.

W5RRR-1>QST [07/12/94 17:17:00] :
Hello from KC5HBV and KC5FVF aboard the Space Shuttle Columbia
We're well into our mission now conducting materials processing and
life sciences experiments that are paving the way for future operations
aboard our international space station
We've talked to schools in Texas, Florida, Hawaii and Germany via SAREX
and it's been great

17-Jul-94 11:33:16 W5RRR-1*>QST :

Hello from KC5HBV and KC5FVF aboard the Space Shuttle Columbia
We're half way into our mission now conducting materials processing and
life sciences experiments that are paving the way for future operations
aboard our international space station
We've talked to schools in Texas, Florida, Hawaii, Louisiana Germany and
Japan via Sarex and really enjoyed their enthusiasm for space exploration
and amateur radio
Wishing you all the best on the upcoming 25th anniversary of humankinds
first steps on the Moon

20-Jul-94 10:21:27 W5RRR-1*>QST :
Greetings from the SAREX station aboard the space shuttle Columbia.
The crew of Columbia is privileged and honored on this 25th anniversary
of one of humankind's greatest achievements to follow in the footsteps
of our craft's namesake, the command module Columbia, which carried
Neil Armstrong, Buzz Aldrin and Michael Collins to the moon. We wish all of
you back on earth who are celebrating this historic anniversary our best
wishes and hope that the one small step for a man taken 25 years ago, will
be a giant leap for people of vision as we go on to International Space Station
and beyond.

21-Jul-94 12:01:17 W5RRR-1*>QST :
With the conclusion of this most successful mission, we wish everyone

on earth the very best and thank you for your support,
KC5HBV, KC5FVF and the rest of the STS-65 Crew.

21-Jul-94 12:02:17 W5RRR-1*>QRZ :

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1129. SAREX Keps/Entry Plasma Trail

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 13:14:36 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-65.019.1994@ampr.org>
Source record: 27229
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-65.019
SAREX Keps/Plasma Trail

Plasma Trail/Shuttle Reentry

People in the southern U.S. should have a very good view of the Space Shuttle entry plasma trail Friday morning. The prime deorbit opportunity is still on rev 219, which will land at KSC about 10 minutes after sunrise there, and pass over Houston, over College Station and Huntsville at 10:31 UTC, an hour before local sunrise. That should give a plasma arc across the sky with a peak of about 15 deg as seen from Houston. Shuttle landing is planned for 10:39 UTC at the Kennedy Space Center. Keep your eyes peeled!

[info provided by Gil Carman, WA5NOM]

SAREX Keplerian Elements

The following is the official SAREX orbital elements for today. These were generated by Ron Parise, WA4SIR, at the Goddard Space Flight Center, and adjusted to improve the drag term by Gil Carman, WA5NOM, of the Johnson Space Center.

STS-65
1 23173U 94039A 94202.29299650 0.00060047 00000-0 23046-3 0 457
2 23173 28.4656 273.5071 0003567 85.8991 274.2028 15.91315128 2020

Satellite: STS-65
Catalog number: 23173
Epoch time: 94202.29299650 (21 JUL 94 07:01:54.90 UTC)
Element set: GSFC-045a
Inclination: 28.4656 deg
RA of node: 273.5071 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003567 Keplerian Elements
Arg of perigee: 85.8991 deg
Mean anomaly: 274.2028 deg
Mean motion: 15.91315128 rev/day Semi-major Axis: 6676.7339 Km
Decay rate: 6.0047E-04 rev/day*2 Apogee Alt: 300.73 Km
Epoch rev: 202 Perigee Alt: 295.96 Km

NOTE - This element set is based on NORAD element set # 045.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1130. Re: Lunar gravitational attraction toward satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 13:20:46 UTC
From: anderson@kosepc01.delcoelect.com
Message-ID: <1994Jul21.132046.12206@kocrsv01.delcoelect.com>
Source record: 27230

In article <Ct79KF.78q@wang.com> dbushong@wang.com (Dave Bushong) writes:
>
>I received the following two questions and have no clue what the
>answers are. Would anyone care to offer an opinion?
>
>1. Does the moon's gravitational attraction exert enough force
> on geosynchronous satellites to cause their position to require
> adjustments?

Yes. Not much, but some. The solar wind and light pressure also "blow"
satellites around a bit. The amount of maneuvering fuel is the prime limit
to the lifetime of a geosynchronous satellite.

>2. Is there a laboratory instrument that shows/measures the attraction
> force between objects? If so, how does it work?

Yes. It's called a spring scale. It works by measuring the compression
or stretching of a spring. You probably have one in your bathroom.

Seriously, any instrument that measures gravitational forces is some kind
of spring scale. Most work by indicating the deflection caused by the
weight of a known mass. Some are fancier, measuring the electrical
current required to cause a magnetic field to counteract the deflection.

==
Alan Anderson || If they put a bunch of cattle in orbit,
(Ham Radio WB9RUF) || would it be the herd shot 'round the world?
My views may not necessarily be those of Delco Electronics or its management.

1131. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 18:08:43 UTC
From: sean@g0oanint.demon.co.uk
Message-ID: <43@g0oanint.demon.co.uk>
Source record: 27235

In article <wrothCt6wvC.8ro@netcom.com> wroth@netcom.com (Wayne D Roth) writes:
>Chris Terwilliger (a229aa@email.sps.mot.com) wrote:

>Not for communication with the pacsats there isn't, or do you know of a
>mac based package that replaces the pb/pg suite? The only way I know
>that you can work the pacsats using broadcast/ftl0 protocal with a mac is
>with an IBM PC emulator.
>--
> wroth@netcom.com

Ok I'll try this again.

Yes there is a version of the broadcast protocal for the Mac, funnily enough
it's called "Broadcast." I have version 2 and it was written by IW2CTJ.

Ther are also several very good sat predication programmes for the Mac.
Personally I use OrbiTrack.

Hope this helps.

Sean.

1132. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 21:25:16 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774825916@afit.af.mil>
Source record: 27233

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94202.25000000 .00002020 00000-0 44397-5 0 453
2 23173 28.4656 273.8288 0003567 85.3765 27.8860 15.91314999 2006
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1133. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 21:25:33 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.774825933@afit.af.mil>
Source record: 27241
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 65
1 23173U 94039A 94202.25000000 .00002020 00000-0 44397-5 0 453
2 23173 28.4656 273.8288 0003567 85.3765 27.8860 15.91314999 2006
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1134. Re: Ham-Space Digest V94 #199

Newsgroup: rec.radio.amateur.space
Date: 1994-07-21 23:02:18 UTC
From: flocq@dialup.FRancenet.FR
Message-ID: <199407212101.XAA19177@adynaton.francenet.fr>
Source record: 27234

>As to there been "very little for the Mac," I personally have about 12 meg of
>ham software for the Mac covering everything from Sats, DXing, TCP/IP, AX25
>Packet, Grayline etc etc. One things for sure, the vast majority of it is a lot
>better written than most Ham PC software I've ever seen. If anyone is
>interested I'd be more than happy to send you a list.

>Sean.

Being a mac user interested in getting into sats and just new on Internet,
I am interested by your list. And if you could point out some of the sites
where I could FTP the packages, that would be of great help. Thank you very
much for this.

Francois

Francois Locqueville : flocq@dialup.francenet.fr

1135. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 02:38:40 UTC
From: ericr@access1.digex.net
Message-ID: <ericr.774844547@access1>
Source record: 27237

wroth@netcom.com (Wayne D Roth) writes:

>Chris Terwilliger (a229aa@email.sps.mot.com) wrote:
>: In article <n7ryw.23.001735AB@teleport.com>, n7ryw@teleport.com (William
>: Roth) wrote:

>: > Avoid a Mac like the plague for anything related to Amateur Radio.

>: This is a really stupid thing to say...typical bias from a "PC" clone...
>: Terry Stader posts a list every month to this newsgroup listing amateur
>: radio software available for the Mac. There is lots of software available
>: and a lot more on the way.

>: --
>: * Chris Terwilliger, AA7WD a229aa@email.sps.mot.com *
>: * Motorola AA7WD@N7MRP.AZ.USA.NA *
>: * Phoenix Corporate Research Labs those who forget the past *
>: * 2100 E. Elliot Rd. EL508 are condemned to repeat it *
>: * Tempe, AZ 85284 - George Santayana *

>Not for communication with the pacsats there isn't, or do you know of a
>mac based package that replaces the pb/pg suite? The only way I know
>that you can work the pacsats using broadcast/ftl0 protocal with a mac is
>with an IBM PC emulator.
>--
> wroth@netcom.com

A Washington, DC local, Gilbert Macklin (not a ham, but a satellite
enthusiast, nonetheless) wrote a PB implementation for the Mac. He left
the area for New Mexico, but was planning to continue the work. HE was
working with Jim White, WD0E, so you might want to contact Jim for the
latest news (he can be reached at wd0e@amsat.org).

GL!

Eric

Eric Rosenberg WD3Q, EI4VPS, ZL0ADG, J20BY, etc.
338 14th Street, NE voice: +202-547-3441
Washington, DC 20002 USA fax: +202-547-3613
ericr@access.digex.com wd3q@amsat.org

1136. STS-65 Orbital State Vector Rev #209

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 07:47:28 UTC
From: astroman@netcom.com
Message-ID: <astromanCtC0B4.Jz8@netcom.com>
Source record: 27238
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 1017
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94202.74741179398
07/21/1994 17:56:16.378 UTC
ECI X: 19271654.241988 ft
M50 Y: -562548.549459 ft
Z: 10334542.138066 ft
Xdot: 619.04175 ft/s
Ydot: 25379.89844 ft/s
Zdot: 223.00296 ft/s
ndot/2 (drag): 0.00080312110 rev/day^2
nddt/6: 2.70473E-08 rev/day^3
Bstar: 2.36490E-04 1/Earth Radii
Elset #: 35
Rev @ Epoch: 209.24705931049

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1137. Re: Hamcom22 program problem

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 07:48:09 UTC
From: so-patu@stekt14.oulu.fi
Message-ID: <SO-PATU.94Jul22104809@stekt14.oulu.fi>
Source record: 27239

I had similar problems->to avoid them i installed four diodes instead of two, and some electrolytic capacitors...hamcomm needs a bridge rectifier, but for example jvfax doesnt, polarity doesnt change when running the program...i think there is version 3.0 hamcomm available today on ftp.funet.fi

Timo, OH6NVG

1138. orbs$203.oscar.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 13:39:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-203.o.1994@ampr.org>
Source record: 27251
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-203.O
Orbital Elements 203.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX July 22, 1994
BID: $ORBS-203.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94195.81899517
Element set: 290
Inclination: 27.0497 deg
RA of node: 317.9184 deg
Eccentricity: 0.6025942
Arg of perigee: 194.3808 deg
Mean anomaly: 135.3303 deg
Mean motion: 2.05882029 rev/day
Decay rate: -2.39e-06 rev/day^2
Epoch rev: 8335
Checksum: 326

Satellite: UO-11
Catalog number: 14781
Epoch time: 94199.48919451
Element set: 708
Inclination: 97.7853 deg
RA of node: 212.7468 deg
Eccentricity: 0.0011606
Arg of perigee: 164.4932 deg
Mean anomaly: 195.6634 deg
Mean motion: 14.69230442 rev/day
Decay rate: 9.8e-07 rev/day^2
Epoch rev: 55490
Checksum: 343

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94197.30647920
Element set: 926
Inclination: 82.9266 deg
RA of node: 307.3174 deg
Eccentricity: 0.0010629
Arg of perigee: 309.9250 deg
```

Mean anomaly: 50.0970 deg
Mean motion: 13.72339165 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 35390
Checksum: 304

Satellite: AO-13
Catalog number: 19216
Epoch time: 94196.85984906
Element set: 931
Inclination: 57.7662 deg
RA of node: 241.7882 deg
Eccentricity: 0.7219935
Arg of perigee: 345.8198 deg
Mean anomaly: 1.7627 deg
Mean motion: 2.09720171 rev/day
Decay rate: 2.17e-06 rev/day^2
Epoch rev: 4661
Checksum: 342

Satellite: FO-20
Catalog number: 20480
Epoch time: 94196.43656308
Element set: 705
Inclination: 99.0371 deg
RA of node: 342.9206 deg
Eccentricity: 0.0539924
Arg of perigee: 275.4857 deg
Mean anomaly: 78.4920 deg
Mean motion: 12.83226347 rev/day
Decay rate: -1.8e-07 rev/day^2
Epoch rev: 20775
Checksum: 327

Satellite: AO-21
Catalog number: 21087
Epoch time: 94197.22316383
Element set: 489
Inclination: 82.9454 deg
RA of node: 121.2318 deg
Eccentricity: 0.0036264
Arg of perigee: 5.6499 deg
Mean anomaly: 354.5058 deg
Mean motion: 13.74542090 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 17357
Checksum: 316

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94198.89454776

Element set: 708
Inclination: 82.9212 deg
RA of node: 348.6696 deg
Eccentricity: 0.0030577
Arg of perigee: 25.1580 deg
Mean anomaly: 335.1056 deg
Mean motion: 13.74043567 rev/day
Decay rate: 2.2e-07 rev/day^2
Epoch rev: 17286
Checksum: 334

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94188.21304092
Element set: 264
Inclination: 1.8958 deg
RA of node: 98.1428 deg
Eccentricity: 0.2918247
Arg of perigee: 185.7752 deg
Mean anomaly: 169.5951 deg
Mean motion: 1.42202950 rev/day
Decay rate: -1.16e-06 rev/day^2
Epoch rev: 148
Checksum: 305

/EX

1139. orbs$203.micro.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 13:40:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-203.d.1994@ampr.org>
Source record: 27255
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-203.D
Orbital Elements 203.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX July 22, 1994
BID: $ORBS-203.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94198.24542996
Element set: 10
Inclination: 98.5893 deg
RA of node: 282.6137 deg
Eccentricity: 0.0011828
Arg of perigee: 100.6891 deg
Mean anomaly: 259.5624 deg
Mean motion: 14.29849660 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 23388
Checksum: 331

Satellite: AO-16
Catalog number: 20439
Epoch time: 94195.78079047
Element set: 808
Inclination: 98.5977 deg
RA of node: 281.4443 deg
Eccentricity: 0.0012030
Arg of perigee: 108.0022 deg
Mean anomaly: 252.2471 deg
Mean motion: 14.29903339 rev/day
Decay rate: 1.0e-07 rev/day^2
Epoch rev: 23354
Checksum: 296

Satellite: DO-17
Catalog number: 20440
Epoch time: 94199.72060632
Element set: 809
Inclination: 98.5990 deg
RA of node: 285.6692 deg
Eccentricity: 0.0012218
Arg of perigee: 96.2295 deg
```

Mean anomaly: 264.0280 deg
Mean motion: 14.30043483 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 23412
Checksum: 298

Satellite: WO-18
Catalog number: 20441
Epoch time: 94197.73736895
Element set: 811
Inclination: 98.5989 deg
RA of node: 283.7090 deg
Eccentricity: 0.0012786
Arg of perigee: 102.3306 deg
Mean anomaly: 257.9303 deg
Mean motion: 14.30017383 rev/day
Decay rate: 1.2e-07 rev/day^2
Epoch rev: 23384
Checksum: 317

Satellite: LO-19
Catalog number: 20442
Epoch time: 94196.24430425
Element set: 807
Inclination: 98.5998 deg
RA of node: 282.4984 deg
Eccentricity: 0.0013130
Arg of perigee: 106.5314 deg
Mean anomaly: 253.7309 deg
Mean motion: 14.30113337 rev/day
Decay rate: -1.3e-07 rev/day^2
Epoch rev: 23364
Checksum: 292

Satellite: UO-22
Catalog number: 21575
Epoch time: 94198.77455892
Element set: 512
Inclination: 98.4336 deg
RA of node: 272.6530 deg
Eccentricity: 0.0007314
Arg of perigee: 193.2332 deg
Mean anomaly: 166.8641 deg
Mean motion: 14.36923567 rev/day
Decay rate: -1.2e-07 rev/day^2
Epoch rev: 15747
Checksum: 323

Satellite: KO-23
Catalog number: 22077
Epoch time: 94198.40713031

Element set: 407
Inclination: 66.0825 deg
RA of node: 216.7082 deg
Eccentricity: 0.0015129
Arg of perigee: 279.4774 deg
Mean anomaly: 80.4534 deg
Mean motion: 12.86286995 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9067
Checksum: 319

Satellite: AO-27
Catalog number: 22825
Epoch time: 94198.16297797
Element set: 305
Inclination: 98.6525 deg
RA of node: 273.6702 deg
Eccentricity: 0.0009098
Arg of perigee: 116.6352 deg
Mean anomaly: 243.5760 deg
Mean motion: 14.27629544 rev/day
Decay rate: 1.5e-07 rev/day^2
Epoch rev: 4196
Checksum: 335

Satellite: IO-26
Catalog number: 22826
Epoch time: 94197.16066415
Element set: 305
Inclination: 98.6521 deg
RA of node: 272.7178 deg
Eccentricity: 0.0009803
Arg of perigee: 121.7855 deg
Mean anomaly: 238.4287 deg
Mean motion: 14.27733649 rev/day
Decay rate: 1.0e-07 rev/day^2
Epoch rev: 4182
Checksum: 316

Satellite: KO-25
Catalog number: 22830
Epoch time: 94197.23470784
Element set: 310
Inclination: 98.5530 deg
RA of node: 269.7323 deg
Eccentricity: 0.0012471
Arg of perigee: 90.3363 deg
Mean anomaly: 269.9244 deg
Mean motion: 14.28060091 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 4184

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Checksum: 292

/EX
```

1140. orbs$203.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 13:42:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-203.w.1994@ampr.org>
Source record: 27256
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-203.W
Orbital Elements 203.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX July 22, 1994
BID: $ORBS-203.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94201.86245204
Element set: 884
Inclination: 99.0478 deg
RA of node: 252.7418 deg
Eccentricity: 0.0015598
Arg of perigee: 122.0163 deg
Mean anomaly: 238.2527 deg
Mean motion: 14.13629378 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 49501
Checksum: 314

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94201.86328615
Element set: 780
Inclination: 98.5077 deg
RA of node: 209.8364 deg
Eccentricity: 0.0012246
Arg of perigee: 229.7166 deg
Mean anomaly: 130.2942 deg
Mean motion: 14.24898582 rev/day
Decay rate: 8.1e-07 rev/day^2
Epoch rev: 40729
Checksum: 332

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94201.62180260
Element set: 342
Inclination: 82.5410 deg
RA of node: 241.9868 deg
Eccentricity: 0.0018350
Arg of perigee: 85.4706 deg
```

Mean anomaly: 274.8550 deg
Mean motion: 13.84718717 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 32698
Checksum: 304

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94198.24789366
Element set: 303
Inclination: 82.5426 deg
RA of node: 302.4101 deg
Eccentricity: 0.0016349
Arg of perigee: 184.3052 deg
Mean anomaly: 175.7944 deg
Mean motion: 13.16968059 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28721
Checksum: 315

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94201.84751066
Element set: 701
Inclination: 99.1768 deg
RA of node: 191.5874 deg
Eccentricity: 0.0012810
Arg of perigee: 40.6400 deg
Mean anomaly: 319.5723 deg
Mean motion: 14.13004374 rev/day
Decay rate: 1.23e-06 rev/day^2
Epoch rev: 29989
Checksum: 293

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94200.24040062
Element set: 304
Inclination: 82.5213 deg
RA of node: 118.3723 deg
Eccentricity: 0.0014637
Arg of perigee: 130.5801 deg
Mean anomaly: 229.6642 deg
Mean motion: 13.84368734 rev/day
Decay rate: 7.9e-07 rev/day^2
Epoch rev: 27212
Checksum: 279

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94201.82721807

Element set: 97
Inclination: 82.5558 deg
RA of node: 246.7281 deg
Eccentricity: 0.0007515
Arg of perigee: 197.8160 deg
Mean anomaly: 162.2765 deg
Mean motion: 13.04420963 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22728
Checksum: 297

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94197.43503863
Element set: 808
Inclination: 82.5412 deg
RA of node: 185.2324 deg
Eccentricity: 0.0017819
Arg of perigee: 65.2598 deg
Mean anomaly: 295.0412 deg
Mean motion: 13.84189727 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 20466
Checksum: 317

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94201.03125279
Element set: 19
Inclination: 98.8361 deg
RA of node: 220.1235 deg
Eccentricity: 0.0015371
Arg of perigee: 283.4599 deg
Mean anomaly: 76.4854 deg
Mean motion: 14.01355080 rev/day
Decay rate: -1.60e-06 rev/day^2
Epoch rev: 19830
Checksum: 290

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94196.29610291
Element set: 816
Inclination: 82.5261 deg
RA of node: 123.6224 deg
Eccentricity: 0.0013521
Arg of perigee: 337.1090 deg
Mean anomaly: 22.9465 deg
Mean motion: 13.83585165 rev/day
Decay rate: 6.8e-07 rev/day^2
Epoch rev: 19164

Checksum: 294

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94196.89854597
Element set: 715
Inclination: 82.5419 deg
RA of node: 149.2965 deg
Eccentricity: 0.0014062
Arg of perigee: 109.2980 deg
Mean anomaly: 250.9665 deg
Mean motion: 13.16463644 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15513
Checksum: 324

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94201.81770658
Element set: 106
Inclination: 98.6161 deg
RA of node: 228.8512 deg
Eccentricity: 0.0013265
Arg of perigee: 134.6683 deg
Mean anomaly: 225.5578 deg
Mean motion: 14.22430093 rev/day
Decay rate: 1.24e-06 rev/day^2
Epoch rev: 16528
Checksum: 290

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94198.22122814
Element set: 724
Inclination: 82.5533 deg
RA of node: 95.5393 deg
Eccentricity: 0.0014509
Arg of perigee: 116.3327 deg
Mean anomaly: 243.9294 deg
Mean motion: 13.16831986 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14041
Checksum: 301

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94198.46389259
Element set: 316
Inclination: 82.5474 deg
RA of node: 182.4409 deg
Eccentricity: 0.0023130

```
Arg of perigee: 137.2472 deg
Mean anomaly: 223.0489 deg
Mean motion: 13.83010394 rev/day
Decay rate: 2.6e-07 rev/day^2
Epoch rev: 4427
Checksum: 302

/EX
```

1141. orbs$203.misc.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 13:43:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-203.m.1994@ampr.org>
Source record: 27252
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-203.M
Orbital Elements 203.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX July 22, 1994
BID: $ORBS-203.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94197.66078408
Element set: 298
Inclination: 98.6462 deg
RA of node: 273.2405 deg
Eccentricity: 0.0010944
Arg of perigee: 108.5827 deg
Mean anomaly: 251.6545 deg
Mean motion: 14.28033511 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 4190
Checksum: 304

Satellite: MIR
Catalog number: 16609
Epoch time: 94199.14525698
Element set: 684
Inclination: 51.6466 deg
RA of node: 31.5281 deg
Eccentricity: 0.0001914
Arg of perigee: 139.9218 deg
Mean anomaly: 220.1916 deg
Mean motion: 15.56612283 rev/day
Decay rate: 5.683e-05 rev/day^2
Epoch rev: 48084
Checksum: 322

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94198.88447229
Element set: 507
Inclination: 28.4692 deg
RA of node: 38.7915 deg
Eccentricity: 0.0006315
Arg of perigee: 49.7864 deg
```

Mean anomaly: 310.3273 deg
Mean motion: 14.90641854 rev/day
Decay rate: 5.04e-06 rev/day^2
Epoch rev: 3397
Checksum: 320

Satellite: GRO
Catalog number: 21225
Epoch time: 94198.58388864
Element set: 116
Inclination: 28.4633 deg
RA of node: 21.1033 deg
Eccentricity: 0.0004080
Arg of perigee: 195.0002 deg
Mean anomaly: 165.0482 deg
Mean motion: 15.41055357 rev/day
Decay rate: 2.710e-05 rev/day^2
Epoch rev: 6163
Checksum: 262

Satellite: UARS
Catalog number: 21701
Epoch time: 94199.17492490
Element set: 556
Inclination: 56.9859 deg
RA of node: 34.8908 deg
Eccentricity: 0.0005691
Arg of perigee: 106.3627 deg
Mean anomaly: 253.8028 deg
Mean motion: 14.96502212 rev/day
Decay rate: 3.329e-05 rev/day^2
Epoch rev: 15557
Checksum: 323

/EX

1142. orbs$203.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 13:44:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-203.n.1994@ampr.org>
Source record: 27253
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-203.N
2Line Orbital Elements 203.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX July 22, 1994
BID: $ORBS-203.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 83355
UO-11
1 14781U 84021B 94199.48919451 .00000098 00000-0 24462-4 0 7086
2 14781 97.7853 212.7468 0011606 164.4932 195.6634 14.69230442554907
RS-10/11
1 18129U 87054A 94197.30647920 .00000024 00000-0 95033-5 0 9267
2 18129 82.9266 307.3174 0010629 309.9250 50.0970 13.72339165353908
AO-13
1 19216U 88051B 94196.85984906 .00000217 00000-0 10000-4 0 9310
2 19216 57.7662 241.7882 7219935 345.8198 1.7627 2.09720171 46619
FO-20
1 20480U 90013C 94196.43656308 -.00000018 00000-0 41546-4 0 7050
2 20480 99.0371 342.9206 0539924 275.4857 78.4920 12.83226347207750
AO-21
1 21087U 91006A 94197.22316383 .00000094 00000-0 82657-4 0 4891
2 21087 82.9454 121.2318 0036264 5.6499 354.5058 13.74542090173572
RS-12/13
1 21089U 91007A 94198.89454776 .00000022 00000-0 76525-5 0 7080
2 21089 82.9212 348.6696 0030577 25.1580 335.1056 13.74043567172868
ARSENE
1 22654U 93031B 94188.21304092 -.00000116 00000-0 00000 0 0 2649
2 22654 1.8958 98.1428 2918247 185.7752 169.5951 1.42202950 1486
UO-14
1 20437U 90005B 94198.24542996 .00000013 00000-0 21993-4 0 108
2 20437 98.5893 282.6137 0011828 100.6891 259.5624 14.29849660233880
AO-16
1 20439U 90005D 94195.78079047 .00000010 00000-0 20657-4 0 8086
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2 20439 98.5977 281.4443 0012030 108.0022 252.2471 14.29903339233543
DO-17
1 20440U 90005E 94199.72060632 .00000023 00000-0 25944-4 0 8095
2 20440 98.5990 285.6692 0012218 96.2295 264.0280 14.30043483234121
WO-18
1 20441U 90005F 94197.73736895 .00000012 00000-0 21436-4 0 8119
2 20441 98.5989 283.7090 0012786 102.3306 257.9303 14.30017383233848
LO-19
1 20442U 90005G 94196.24430425 -.00000013 00000-0 11687-4 0 8079
2 20442 98.5998 282.4984 0013130 106.5314 253.7309 14.30113337233640
UO-22
1 21575U 91050B 94198.77455892 -.00000012 00000-0 10550-4 0 5123
2 21575 98.4336 272.6530 0007314 193.2332 166.8641 14.36923567157470
KO-23
1 22077U 92052B 94198.40713031 -.00000037 00000-0 10000-3 0 4075
2 22077 66.0825 216.7082 0015129 279.4774 80.4534 12.86286995 90673
AO-27
1 22825U 93061C 94198.16297797 .00000015 00000-0 23765-4 0 3051
2 22825 98.6525 273.6702 0009098 116.6352 243.5760 14.27629544 41964
IO-26
1 22826U 93061D 94197.16066415 .00000010 00000-0 21762-4 0 3052
2 22826 98.6521 272.7178 0009803 121.7855 238.4287 14.27733649 41821
KO-25
1 22830U 93061H 94197.23470784 .00000014 00000-0 23059-4 0 3104
2 22830 98.5530 269.7323 0012471 90.3363 269.9244 14.28060091 41842
NOAA-9
1 15427U 84123A 94201.86245204 .00000025 00000-0 37588-4 0 8849
2 15427 99.0478 252.7418 0015598 122.0163 238.2527 14.13629378495012
NOAA-10
1 16969U 86073A 94201.86328615 .00000081 00000-0 53037-4 0 7809
2 16969 98.5077 209.8364 0012246 229.7166 130.2942 14.24898582407293
MET-2/17
1 18820U 88005A 94201.62180260 .00000030 00000-0 13392-4 0 3428
2 18820 82.5410 241.9868 0018350 85.4706 274.8550 13.84718717326982
MET-3/2
1 19336U 88064A 94198.24789366 .00000051 00000-0 10000-3 0 3033
2 19336 82.5426 302.4101 0016349 184.3052 175.7944 13.16968059287213
NOAA-11
1 19531U 88089A 94201.84751066 .00000123 00000-0 91138-4 0 7018
2 19531 99.1768 191.5874 0012810 40.6400 319.5723 14.13004374299896
MET-2/18
1 19851U 89018A 94200.24040062 .00000079 00000-0 57565-4 0 3041
2 19851 82.5213 118.3723 0014637 130.5801 229.6642 13.84368734272123
MET-3/3
1 20305U 89086A 94201.82721807 .00000044 00000-0 10000-3 0 973
2 20305 82.5558 246.7281 0007515 197.8160 162.2765 13.04420963227287
MET-2/19
1 20670U 90057A 94197.43503863 .00000011 00000-0 -31660-5 0 8081
2 20670 82.5412 185.2324 0017819 65.2598 295.0412 13.84189727204666
FY-1/2
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1 20788U 90081A 94201.03125279 -.00000160 00000-0 -77572-4 0 192
2 20788 98.8361 220.1235 0015371 283.4599 76.4854 14.01355080198306
MET-2/20
1 20826U 90086A 94196.29610291 .00000068 00000-0 48554-4 0 8162
2 20826 82.5261 123.6224 0013521 337.1090 22.9465 13.83585165191643
MET-3/4
1 21232U 91030A 94196.89854597 .00000051 00000-0 10000-3 0 7153
2 21232 82.5419 149.2965 0014062 109.2980 250.9665 13.16463644155135
NOAA-12
1 21263U 91032A 94201.81770658 .00000124 00000-0 75026-4 0 1068
2 21263 98.6161 228.8512 0013265 134.6683 225.5578 14.22430093165287
MET-3/5
1 21655U 91056A 94198.22122814 .00000051 00000-0 10000-3 0 7249
2 21655 82.5533 95.5393 0014509 116.3327 243.9294 13.16831986140412
MET-2/21
1 22782U 93055A 94198.46389259 .00000026 00000-0 10264-4 0 3168
2 22782 82.5474 182.4409 0023130 137.2472 223.0489 13.83010394 44273
POSAT
1 22829U 93061G 94197.66078408 .00000024 00000-0 27399-4 0 2983
2 22829 98.6462 273.2405 0010944 108.5827 251.6545 14.28033511 41902
MIR
1 16609U 86017A 94199.14525698 .00005683 00000-0 85088-4 0 6842
2 16609 51.6466 31.5281 0001914 139.9218 220.1916 15.56612283480844
HUBBLE
1 20580U 90037B 94198.88447229 .00000504 00000-0 35078-4 0 5070
2 20580 28.4692 38.7915 0006315 49.7864 310.3273 14.90641854 33977
GRO
1 21225U 91027B 94198.58388864 .00002710 00000-0 57502-4 0 1166
2 21225 28.4633 21.1033 0004080 195.0002 165.0482 15.41055357 61637
UARS
1 21701U 91063B 94199.17492490 .00003329 00000-0 31148-3 0 5564
2 21701 56.9859 34.8908 0005691 106.3627 253.8028 14.96502212155576
/EX
```

1143. STS-65 Element Set (94203.609)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 17:01:01 UTC
From: elements-request@alsys.com
Message-ID: <STS-65.94203.609@alsys.com>
Source record: 27242
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-65
1 23173U 94039A 94203.60901007 .00120346 00000-0 25037-3 0 494
2 23173 28.4655 263.6371 0006312 86.2727 273.8663 16.10869786 2234

Satellite: STS-65
Catalog number: 23173
Epoch time: 94203.60901007 = (22 JUL 94 14:36:58.47 UTC)
Element set: 049
Inclination: 28.4655 deg
RA of node: 263.6371 deg Space Shuttle Flight STS-65
Eccentricity: .0006312 Keplerian element set JSC-049
Arg of perigee: 86.2727 deg from NASA flight Day 15 vector
Mean anomaly: 273.8663 deg
Mean motion: 16.10869786 rev/day G. L. Carman
Decay rate: 1.20346e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 223

--
Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1144. Moonbounce

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 18:16:57 UTC
From: laplante@unirsvl.rsvl.unisys.com
Message-ID: <CtCtGA.I1r@unirsvl.rsvl.unisys.com>
Source record: 27247
Cross-posted to: rec.radio.amateur.digital.misc,rec.radio.amateur.space

Has anyone played around with using RTTY for moonbounce? I understand that standard RTTY requires even better s/n ratios than SSB, which doesn't bode well for sucessful EME, but since the standard shift is only 170Hz it seems that RTTY could be crammed into a much narrower band-width, which would help (although it would limit the baud rate!).

It seems that with a syncronous transmission (rather than sync on a character basis) combined with a BCC for error correction, and multiple transmissions of the same message might give a smart (read PC) recieving TTY a chance at successful decoding in spite of very marginal s/n conditions.

Any interest? Any hope?

Bryan LaPlante KB0OBT
laplante@rsvl.unisys.com

1145. Re: Ham-Space Digest V94 #199

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 18:23:28 UTC
From: sean@g0oanint.demon.co.uk
Message-ID: <44@g0oanint.demon.co.uk>
Source record: 27246

In article <199407212101.XAA19177@adynaton.francenet.fr>
flocq@dialup.FRancenet.FR (Francois Locqueville) writes:

>Being a mac user interested in getting into sats and just new on Internet,
>I am interested by your list. And if you could point out some of the sites
>where I could FTP the packages, that would be of great help. Thank you very
>much for this.
>

Francois,

I have in the last few days uploaded my entire library of Mac software into a
new Mac Ham software FTP area, details are,

ftp.demon.co.uk /pub/ham/mac

You should find a few things in there to get you started, other places to look
are,

joker.optics.rochester.edu (/ham)
sumex-aim.stanford.edu (/info-mac/app)
mac.archive.umich.edu various locations
uxc.cso.uiuc.edu (/pub/ham-radio)
ucsd.edu (/hamradio) many different subdirectories
(/hamradio/packet/tcp/incoming) newest
files temp holding area
(/hamradio/packet/tcpip/pa2aga)
NET/Mac & IM/Mac area
ftp.apple.com (/pub/ham-radio)
akutaktak.andrew.cmu.edu (/aw0g)
softkiss-mac nic.switch.ch (/software/mac/ham-radio)
oak.oakland.edu (/pub/hamradio/mac)

Thanks to Terry Stader - KA8SCP and Patty Winter - N6BIS for the above
information.

Regards,

Sean.

1146. * SpaceNews 25-Jul-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 19:29:10 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0725.1994@ampr.org>
Source record: 27254
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0725
* SpaceNews 25-Jul-94 *

BID: $SPC0725

=========
SpaceNews
=========

MONDAY JULY 25, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* LUSAT NEWS *
==============
The LUSAT-OSCAR-19 satellite continues to operate without its file server running. The satellite continues to transmit the following beacon:

LUSAT-1>AMARG <UI>:
May 21.
OBC crashed on May 17 at +/- 2:45 utc, lat 45s, lon 43 w.
Only digipeater is available.

Although the file server is not available, the satellite does function as a digipeater, and other ground stations can be connected point to point, via LUSAT-1. The satellite has uplinks on 145.840, 145.860, 145.880, and 145.900 MHz using 1200 bps AX.25 Manchester encoded FSK. The BPSK downlink is on a frequency of 437.135 MHz.

Binary telemetry transmissions made by LUSAT-1 indicate that the spacecraft is in good health and transmitting with an output power of a little more than one watt.

Frank, KB2MVN in East Chatham, New York is making available his packet mailbox via LUSAT-1. Stations on the east coast of North America can connect to the mailbox when under a common footprint with Frank using a regular terminal program by issuing the command:

c kb2mvn v lusat-1

Monitor LUSAT's beacon to determine if the mailbox is active and accessible from your ground station location. Frank asks that you leave him a message if you are able to access the mailbox.

[Info via LU2BDT and KB2MVN]

* STS-65 SAREX INFO *
=====================
Greg LaBorde, KD6MSM, at the Jet Propulsion Laboratory in Pasadena, California pointed out that some of the callsigns that appeared in the STS-65 SAREX packet frames in last week's issue of SpaceNews were actually those of DX Packet Clusters and their users. This is apparently the result of frequency sharing between the K6EXO DX Cluster in Los Angeles, California and the SAREX package on the Space Shuttle Columbia.

Joe, WA2GSY, in New Jersey provided the following packet frame received from the Space Shuttle Columbia on 21-Jul-94 at 10:26:16 UTC:

W5RRR-1>QST <UI>:
With the conclusion of this most successful mission, we wish everyone on earth the very best and thank you for your support,
KC5HBV, KC5FVF and the rest of the STS-65 Crew.

* KD2BD PACSAT MODEM *
======================
The August 1994 issue of QEX magazine will carry an article describing the "KD2BD Pacsat Modem", a high-performance 1200 bps BPSK modem designed for communication with "Pacsat" satellites. QEX is an experimenter's journal published by the American Radio Relay League.

The KD2BD Pacsat Modem is the result of several years of development and testing. It was designed around commonly available components for easy duplication and provides outstanding performance.

Among the modem's strengths is its ability to successfully decode BPSK signals well into the noise level using correlation decoding techniques. The modem can be used for communication with PACSAT, WEBERSAT, LUSAT, FO-20, and ITAMSAT as well as many future digital store-and-forward amateur communication satellites. It can also be used for weak signal terrestrial packet radio communications.

In operation, the modem demodulates binary phase shift keying signals received from the downlink of a digital amateur communications satellite via a 70-cm SSB receiver and antenna system. A digital AFC circuit in the modem automatically adjusts the receiver tuning in response to Doppler shift. The modem also generates a Manchester encoded serial data stream that when fed into the microphone connector of a 2-meter FM transmitter, produces 1200 bps Manchester encoded FSK suitable for establishing a full duplex digital communications link with Pacsat satellites.

Schematics, photographs, and a discussion of the modem design and its operation are included in the article. As evidence of its performance, a copy of this issue of SpaceNews has been uploaded to the AMSAT-OSCAR-16 microsat using the KD2BD Pacsat Modem, and will remain available for the next several days.

* AMSAT-OSCAR-21 NEWS *
=======================
At 16:17:43 EDT (20:17:43 UTC), Sunday afternoon, July 20, 1969, astronaut Neil A. Armstrong spoke the words:

"Houston, Tranquility Base here. The Eagle has landed."

At 20:56 EDT, later the same day, Armstrong stepped down from the ladder of the Lunar Module onto the Moon's surface and said:

"That's one small step for (a) man, one giant leap for mankind."

Edwin Aldrin followed him about 15 Minutes later, while Michael Collins orbited the Moon with the APOLLO-11 Command and Service Module at an altitude of 100 kilometers.

To commemorate the anniversary of this historic event, a special Multi-Media Broadcast has been uploaded into the RUDAK system on the AMSAT-OSCAR-21 satellite that includes the historic words and the APOLLO-11 logo in APT FAX format.

AMSAT-OSCAR-21's RUDAK downlink is a frequency of 145.987 MHz and can be received anywhere in the world using a narrowband FM receiver when the satellite is above the local horizon.

[Info via Peter, DB2OS, on behalf of AMSAT-DL and AMSAT-Russia]

* JUPITER OBSERVATIONS *
==========
Amateur astronomer Syl Pauley, K1ZFN, in Warwick, Rhode Island observed the remanants of two comet "hits" into the planet Jupiter using his 13.1-inch reflecting telescope (Dobsonian) and a 4 mm eyepiece. The holes created in the Jovian atmosphere were readily observable by him and interested neighbors. Observations were made at approximately 9:30 PM EDT on 19-Jul-94.

Syl would like to hear of any other reports from observations made by others using small telescopes. Syl can be reached via his packet radio address: K1ZFN @ KC1CE.

[Info via Syl, K1ZFN]

* SSTV ON OSCAR 13 *
==========
Slow scan television (SSTV) enthusiats are invited to join the SSTV sessions being carried on the AMSAT-OSCAR-13 satellite on a downlink frequency of 145.955 MHz.

The SSTV net meets at 45 minutes before the Mode S transponder is activated, and on Mode B following Mode S sessions on Saturdays and Sundays. Comments on these nets should be directed to wb6llo@amsat.org who is coordinating the SSTV nets on AO-13.

[Info via Dave Guimont]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

FB1RCI VA3ART G4RLZ WB6SHI ZS6BMN K8RBV N8HOL TG9IKE N0VMR

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1147. Apollo CAPCOM courtesty tones

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 20:14:45 UTC
From: roman@jethro.sps.mot.com
Message-ID: <1994Jul22.201445.4763@newsgate.sps.mot.com>
Source record: 27243

If anyone has the technical description of the courtesy tones used by NASA (freq., duration, etc.) I would appreciate an e-mail or a posting of this info.

Thanks
roman robles
KI5XZ
roman@jethro.sps.mot.com
.

1148. Apollo Courtesy Tones

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 20:18:31 UTC
From: roman@jethro.sps.mot.com
Message-ID: <1994Jul22.201831.4881@newsgate.sps.mot.com>
Source record: 27244

if any could post or e-mail the tech. spec.s of the courtesy tones
used by NASA, I would be quite appreciative.

Thanks

roman robles
KI5XZ
roman@jethro.sps.mot.com

1149. STS-65 Orbital State Vector Rev #224

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 22:34:01 UTC
From: astroman@netcom.com
Message-ID: <astromanCtD5Cp.z8@netcom.com>
Source record: 27245
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 1017
Satellite Name: STS-65
Catalog Number: 23173 94039A
Epoch Date/Time: 94203.67836572917
07/22/1994 16:16:50.799 UTC
ECI X: 10906021.645453 ft
M50 Y: -17402592.677891 ft
Z: 7017331.470710 ft
Xdot: 18505.12891 ft/s
Ydot: 15169.78125 ft/s
Zdot: 8785.91016 ft/s
ndot/2 (drag): 0.00310904074 rev/day^2
nddt/6: 4.00435E-07 rev/day^3
Bstar: 2.89985E-04 1/Earth Radii
Elset #: 37
Rev @ Epoch: 224.11997396445

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1150. Re: WEFAX from PYE TELECOMMUNICATIONS PT AM 10DYV Receiver?

Newsgroup: rec.radio.amateur.space
Date: 1994-07-22 22:39:39 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <CtD5M4.LDv@freenet.carleton.ca>
Source record: 27258

In a previous article, wwg@coutts.UUCP (Warren Gay) says:

>The issue: Can this receiver work at 137+ Mhz?
>
>I have a PYE aircraft AM transceiver, that was modified to be a RX
>only unit (which is fine), using the two crystal sockets for two different
>receive frequencies, since the TX crystal is no longer needed.
>
>
>Of course, I'm assuming that NOAA signals are AM audio signals. However,
>if this should turn out to be FM instead-- no big deal. I can build a
>demod circuit after the IF section. Email preferred, thanks.
>
Well,NOAA is FM and you may be able to fab a demod.But
your IF bandwidth is likely too narrow since you'll need
about 30 - 40 kHz.I suggest to check this first before
spending any $$.
Good luck.
>--------------------
>Warren W. Gay VE3WWG John Coutts Library Services Limited
>wwg@coutts.UUCP Niagara Falls, Ontario, Canada
>(or wwg%coutts@uunet.ca, wwg%coutts@uunet.uu.net)
>

1151. TrackBox...Help

Newsgroup: rec.radio.amateur.space
Date: 1994-07-23 14:58:07 UTC
From: tsmithers@cix.compulink.co.uk
Message-ID: <CtEEwv.IHv@cix.compulink.co.uk>
Source record: 27248

I have just finished building a TB pcb (SM0TER/JA6FTL design) and seem to have lost one of the "special" ic's ..PST 532 battery monitor.
I got the kit from AMSAT-UK but they dont carry any spares and its not listed in any of the major UK catalogs. Does anyone know of a mail order source for this chip that deals in small orders ie "one".

I gather that TAPR also supply this kit, has anyone got an E mail contact address and do the supply spares.

Any info would be appreciated.

73 Trevor G0KTN
tsmithers@cix.compulink.co.uk

1152. Re: Moonbounce

Newsgroup: rec.radio.amateur.space
Date: 1994-07-23 16:37:39 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Jul23.163739.21509@gov.nt.ca>
Source record: 27249
Cross-posted to: rec.radio.amateur.digital.misc,rec.radio.amateur.space

In article <CtCtGA.I1r@unirsvl.rsvl.unisys.com> laplante@unirsvl.rsvl.unisys.com (Bryan LaPlante x7140) writes:
>Has anyone played around with using RTTY for moonbounce? I understand that
>standard RTTY requires even better s/n ratios than SSB, which doesn't bode
>well for sucessful EME, but since the standard shift is only 170Hz it seems
>that RTTY could be crammed into a much narrower band-width, which would help
>(although it would limit the baud rate!).
>
>It seems that with a syncronous transmission (rather than sync on a character
>basis) combined with a BCC for error correction, and multiple transmissions
>of the same message might give a smart (read PC) recieving TTY a chance at
>successful decoding in spite of very marginal s/n conditions.
>
>Any interest? Any hope?
>
>Bryan LaPlante KB0OBT
>laplante@rsvl.unisys.com

Hi Bryan,
I've been playing with unproto Pactor on Oscar 13. Pactor FEC has the
advantage that you can set the number of repeats to a max of 6 or 7 so
even though the throughput goes way down the message can still get
through uncorrupted. Amtor FEC would work too but not nearly as well.
Via EME would be quite a challenge but between two reasonably well
equipped stations it should do OK. I'll be on EME this winter but
my station will fall into the "marginal" category so I don't expect
to be working much ssb & rtty.
Good luck,
John - VE8EV
==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

1153. STS-58 QSL cards arrive

Newsgroup: rec.radio.amateur.space
Date: 1994-07-23 20:58:48 UTC
From: moisan@bronze.lcs.mit.edu
Message-ID: <30s0a8$g11@bronze.lcs.mit.edu>
Source record: 27250
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

People waiting for their STS58 cards should take heart; I got mine today,
along with a nice green pamphlet marked "STS-58 NASA-JSC Flight Integration
Office" that notes the payloads. Good work!

...Dave

--
| David Moisan, N1KGH /^_/^\ moisan@silver.lcs.mit.edu |
| 86 Essex St. Apt #204 (o ^ o) n1kgh@amsat.org |
| Salem. MA 01970-5225 | | ce393@cleveland.freenet.edu |
| |

1154. ARLK029 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-07-23 23:16:34 UTC
From: w1aw@arrl.org
Message-ID: <$arlk029.1994@ampr.org>
Source record: 27257
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK029
ARLK029 Keplerian data

ZCZC SK96
QST de W1AW
Keplerian Bulletin 29 ARLK029
>From ARRL Headquarters
Newington, CT July 23, 1994
To all radio amateurs

SB KEP ARL ARLK029
ARLK029 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 55387
RS-10/11
1 18129U 87054A 94197.30647920 .00000024 00000-0 95033-5 0 9267
2 18129 82.9266 307.3174 0010629 309.9250 50.0970 13.72339165353908
UO-11
1 14781U 84021B 94199.48919451 .00000098 00000-0 24462-4 0 7086
2 14781 97.7853 212.7468 0011606 164.4932 195.6634 14.69230442554907
RS-12/13
1 21089U 91007A 94198.89454776 .00000022 00000-0 76525-5 0 7080
2 21089 82.9212 348.6696 0030577 25.1580 335.1056 13.74043567172868
AO-13
1 19216U 88051B 94196.85984906 .00000217 00000-0 10000-4 0 9310
2 19216 57.7662 241.7882 7219935 345.8198 1.7627 2.09720171 15110
UO-14
1 20437U 90005B 94198.24542996 .00000013 00000-0 21993-4 0 108
2 20437 98.5893 282.6137 0011828 100.6891 259.5624 14.29849660233880
AO-16
1 20439U 90005D 94195.78079047 .00000010 00000-0 20657-4 0 8086
2 20439 98.5977 281.4443 0012030 108.0022 252.2471 14.29903339233543
DO-17
1 20440U 90005E 94199.72060632 .00000023 00000-0 25944-4 0 8095
2 20440 98.5990 285.6692 0012218 96.2295 264.0280 14.30043483234121
```

```
WO-18
1 20441U 90005F 94197.73736895 .00000012 00000-0 21436-4 0 8119
2 20441 98.5989 283.7090 0012786 102.3306 257.9303 14.30017383233848
LO-19
1 20442U 90005G 94196.24430425 -.00000013 00000-0 11687-4 0 8079
2 20442 98.5998 282.4984 0013130 106.5314 253.7309 14.30113337233640
FO-20
1 20480U 90013C 94196.43656308 -.00000018 00000-0 41546-4 0 7050
2 20480 99.0371 342.9206 0539924 275.4857 78.4920 12.83226347207750
AO-21
1 21087U 91006A 94197.22316383 .00000094 00000-0 82657-4 0 4891
2 21087 82.9454 121.2318 0036264 5.6499 354.5058 13.74542090173572
UO-22
1 21575U 91050B 94198.77455892 -.00000012 00000-0 10550-4 0 5123
2 21575 98.4336 272.6530 0007314 193.2332 166.8641 14.36923567157470
KO-23
1 22077U 92052B 94198.40713031 -.00000037 00000-0 10000-3 0 4075
2 22077 66.0825 216.7082 0015129 279.4774 80.4534 12.86286995 90673
KO-25
1 22830U 93061H 94197.23470784 .00000014 00000-0 23059-4 0 3104
2 22830 98.5530 269.7323 0012471 90.3363 269.9244 14.28060091 41842
IO-26
1 22826U 93061D 94197.16066415 .00000010 00000-0 21762-4 0 3052
2 22826 98.6521 272.7178 0009803 121.7855 238.4287 14.27733649 41821
AO-27
1 22825U 93061C 94198.16297797 .00000015 00000-0 23765-4 0 3051
2 22825 98.6525 273.6702 0009098 116.6352 243.5760 14.27629544 41964
PO-28
1 22829U 93061G 94197.66078408 .00000024 00000-0 27399-4 0 2983
2 22829 98.6462 273.2405 0010944 108.5827 251.6545 14.28033511 41902
Mir
1 16609U 86017A 94202.86878877 .00003462 00000-0 54462-4 0 6874
2 16609 51.6485 12.9003 0002122 159.0876 201.0203 15.56642279481425

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
July 26, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1155. antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-07-24 13:12:27 UTC
From: whitestone@ins.infonet.net
Message-ID: <30tpbr$4cj@insosf1.infonet.net>
Source record: 27118

I am considering putting up the Hy Gain set of antennas. Would like to hear from others about these antennas.

KE0PV - Larry

1156. Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-24 15:05:40 UTC
From: Ron.Parsons@f40.n382.z1.fidonet.org
Message-ID: <775067586.AA01260@afarm.uucp>
Source record: 27260

>Yes there is a version of the broadcast protocal for the Mac, funnily enough
>it's called "Broadcast." I have version 2 and it was written by IW2CTJ.

Do you have a location where this file can be downloaded?

Ron W5RKN

1157. Jupiter photos

Newsgroup: rec.radio.amateur.space
Date: 1994-07-24 16:36:24 UTC
From: carrl@gordon-tsd1.army.mil
Message-ID: <9407241636.AA00994@gordon-tsd1.army.mil>
Source record: 27259

Where is best place to download pictures of comets hitting
jupiter? thks,
carrl@gordon-tsd1.army.mil

1158. Giant leap via AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-07-24 23:46:29 UTC
From: david@pitvax.xx.rmit.edu.au
Message-ID: <30uuo8$reb@aggedor.rmit.EDU.AU>
Source record: 27111

I heard an unusual message transmitted by AO-21 on a short, low elevation pass this weekend, on the 70cm - 2m FM translator output.

It was unmistakable - Neil Armstrongs immortal words "One small step for (a) man, one giant leap for mankind."

Then the satellite went below the horizon and the signal faded into the noise.

Was this to mark the 25th anniversary of the moon landing or was someone in VK playing tricks?

If the former, then the audio must have been digitally encoded and sent to the satellite for playback - another amazing function of the onboard DSP.

Anyone else hear this? Any Comments?

David VK3JKP

1159. ANS-204 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 02:28:10 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-204.01.1994@ampr.org>
Source record: 27112
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-204.01
PHASE-3D STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 204.01 FROM AMSAT HQ
SILVER SPRING, MD JULY 23, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-204.01

SSTV ON OSCAR 13

Phase-3D Spaceframe Arrives In Florida

Following its completion at the Center for Aerospace Technology at Weber State University in Ogdon, Utah, the Phase-3D spaceframe arrived Monday, July 18th at the AMSAT Phase-3D Integration Facility now established at the Orlando International Airport. It now resides in the clean room which has just been completed at the facility.

Dick Jansson (WD4FAB), AMSAT Vice President for Engineering, said that the spaceframe arrived in good shape after being trucked across the country. He indicated that the next job is a thorough inspection of all the various pieces and then applying special coating to them.

Future ANS bulletins will provide updates on the progress of the Phase-3D integration as events warrant.

[The AMSAT News Serive (ANS) wishes to thank Dick Jansson and Stan Wood (WA4NFY) for this information.]

/EX
SB SAT @ AMSAT $ANS-204.02
AMSAT SPACE SYMPOSIUM DATES

HR AMSAT NEWS SERVICE BULLETIN 204.02 FROM AMSAT HQ
SILVER SPRING, MD JULY 23, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-204.02

'94 AMSAT-NA Space Symposium Date Correction

AMSAT-NA would like to correct an error in the 1994 Space Symposium registration form, which was distributed with the AMSAT Board of Directors ballots. The dates for the Symposium are Friday, Saturday, and Sunday October 7, 8 and 9, and NOT October 8, 9 and 10 as indicated.

/EX
SB SAT @ AMSAT $ANS-204.03

FAMOUS STS-65 SAREX CONTACT

HR AMSAT NEWS SERVICE BULLETIN 204.03 FROM AMSAT HQ
SILVER SPRING, MD JULY 23, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-204.03

Former Apollo-11 Astronaut Talks To STS-65 Astronauts With SAREX

On Saturday July 16, the 25th anniversary of the liftoff of Apollo-11 on its historic journey to the moon, General Thomas Stafford (Ret), a former NASA astronaut who flew on-board several Gemini and Apollo missions, exchanged greetings with STS-65 mission commander Robert Cabana, KC5HBV, using the Shuttle Amateur Radio Experiment (SAREX) radio. General Stafford was in Oklahoma City attending the Airshow America. Using the SAREX telebridge, General Stafford was able to communicate with Commander Cabana first through a ground station in Hawaii and then through a ground station in San Diego. A special phone patch also allowed the crowd of 150,000 spectators at the airshow to hear this historic SAREX contact. After Commander Cabana extended his greeting from space, Stafford asked about the Shuttle and living in space. General Stafford was quick to point out that "the Space Shuttle can be considered luxurious living as compared to that small capsule I flew in during my flight on Apollo-10 25 years ago". General Stafford thanked Commander Cabana for the contact and signed clear.

One observation made by the SAREX team was the virtual silence of the audience during this live exchange between the former astronaut and the Space Shuttle Commander as compared to the deafening roar of the crowd and the planes during the air show. It seemed that the audiance was truly transfixed by our (amateur radio's) ability to talk to an astronaut while they are in space.

[The AMSAT News Service would like to thank the SAREX Working Group and Frank Bauer (KA3HDO) for this bulletin item. Others who deserve mention and assisted in this SAREX contact are listed below.]

Members participating:

Dick Flagg, WH6CJU in Hawaii
Kerry Banke, N6IZW in San Diego
Bob Douglas, W5GEL in Corpus Christi
Frank Bauer, KA3HDO in Silver SPring, MD
Lou McFadin, W5DID in Houston
Gil Carman, WA5NOM in Houston
Darome Telecommunications in Chicago

/EX
SB SAT @ AMSAT $ANS-204.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 204.04 FROM AMSAT HQ
SILVER SPRING, MD JULY 23, 1994
TO ALL RADIO AMATEURS BT

BID: $ANS-204.04

Weekly OSCAR Status Reports: 23-JUL-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
[G3RUH/DB2OS/VK5AGR]

DO-17: DO-17 still continues to transmit its voice message on a downlink frequency of 145.825 MHz.

RS-10: N2WWD would like to pass on some observations regarding RS-10. The signal in the past week seems stronger than normal. More interesting than this is that it appears that the translation constant between the Mode-A passbands seems to have shifted by about 1 KHz. This translation constant appears to have moved from 5 KHz to 6 KHz (when the effects of Doppler shift are removed). Thus, in the past where 145.910/29.386 MHz would be a corres-onding uplink/downlink frequency pair, however, presently N2WWD needs to use 145.910/29.385 MHz to achieve the same results. This holds consistently for 3 different sets of Keplerian elements used. N2WWD would like to know if others have similar reports? [N2WWD]

AO-21: The speech synthesizer will be reproducing Neil Armstrongs famous words that he spoke as he stepped upon the Moon's surface 25 years ago this past week. Listen for the downlink on 145.987 MHz FM. [DB2OS]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1160. Re: Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 06:46:30 UTC
From: sean@g0oanint.demon.co.uk
Message-ID: <46@g0oanint.demon.co.uk>
Source record: 27116

In article <775067586.AA01260@afarm.uucp> Ron.Parsons@f40.n382.z1.fidonet.org
(Ron Parsons) writes:
>>Yes there is a version of the broadcast protocal for the Mac, funnily enough
>>it's called "Broadcast." I have version 2 and it was written by IW2CTJ.
>
>Do you have a location where this file can be downloaded?
>
>Ron W5RKN
>

ftp.demon.co.uk /pub/ham/mac

Regards.

1161. APT-Satellites: Report JULY 23, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 07:00:52 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-250794070236@oskar.gmd.de>
Source record: 27113
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
Observed at station 50.7 NLat, 7.1 ELon, JULY 23, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 *OFF*
Meteor 3-5: APT 137.85 On

Good images from all active APT-Satellites.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

1162. Re: Giant leap via AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 08:26:00 UTC
From: barkman@zeta.is.tcu.edu
Message-ID: <1994Jul25.033155.259@news.tcu.edu>
Source record: 27114

In article <30uuo8$reb@aggedor.rmit.EDU.AU>, david@pitvax.xx.rmit.edu.au writes...
>Was this to mark the 25th anniversary of the moon landing or was someone
>in VK playing tricks?
>
>David VK3JKP
It was not a trick. It is a special message that plays twice in a row during
a pass. BTW, does anyone know the schedule for voice/pre-recorded voice/wefax
on AO-21? i.e., is there a certain minute that the repeater comes active?

myles KG5AI

1163. AO-27, UO-11, UO-15, AO-21 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 08:46:00 UTC
From: barkman@zeta.is.tcu.edu
Message-ID: <1994Jul25.035610.260@news.tcu.edu>
Source record: 27115

AO-27:
I worked AO-27 for the first time tonight and noticed something. Is it usually full of ragchewers that tie up the satellite like they are on 75 meters? Sounded like it was their own personal satellite. Is it on all the time? Seemed like I had to key up a few times and then there was the signal all of a sudden. It was up to 23 degrees before I finally heard it.

UO-11, UO-15:
What are these birds used for and what modes do they use? Think I heard something digital on 145.825 when UO-11 came over but when UO-15 passed, I heard nothing on 435.120.

AO-21:
Are all transponders active on this? I only heard a beacon on 145.819 and, of course, the digital repeater.

Thanks es 73

myles KG5AI

1164. Re: AO-27, UO-11, UO-15, AO-21 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 10:21:24 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940725102124@ken_durham.sc.ti.com>
Source record: 27119

In article <1994Jul25.035610.260@news.tcu.edu> barkman@zeta.is.tcu.edu (Myles Barkman - KG5AI) writes:

>> AO-27:
>> I worked AO-27 for the first time tonight and noticed something. Is it
>> usually full of ragchewers that tie up the satellite like they are on
>> 75 meters? Sounded like it was their own personal satellite. Is it on all
>> the time? Seemed like I had to key up a few times and then there was the
>> signal all of a sudden. It was up to 23 degrees before I finally heard it.
>>
>> UO-11, UO-15:
>> What are these birds used for and what modes do they use? Think I heard
>> something digital on 145.825 when UO-11 came over but when UO-15 passed,
>> I heard nothing on 435.120.
>>
>> AO-21:
>> Are all transponders active on this? I only heard a beacon on 145.819
>> and, of course, the digital repeater.
>>
>> Thanks es 73
>>
>> myles KG5AI
>>

Your observation of the type of operation on AO-27 is accurate. I used to work it from my mobile station, but have had to give it up due to the large number of high power base stations with large uplink beams using it for passing recipes etc. On the rare occasions when this satellite is not cluttered, 4 W talkies with rubber duckies can work each other.

AO-21 is much worse because it has been around longer. The regulars on this one use 40 el uplink beams and 1 KW plus amplifiers. The downlink is 145.987 Mhz FM and the uplink is 435.016 Mhz FM.

For info on the other birds you mightr pick up a copy of "The Satellite Experimenters Handbook".

Ken K5MBV

1165. Re: Giant leap via AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 11:16:37 UTC
From: dave@sectel.com
Message-ID: <775163797snx@sectel.com>
Source record: 27117

In article <30uuo8$reb@aggedor.rmit.EDU.AU> david@pitvax.xx.rmit.edu.au writes:
> I heard an unusual message transmitted by AO-21 on a short, low elevation
> pass this weekend, on the 70cm - 2m FM translator output.
>
> It was unmistakable - Neil Armstrongs immortal words "One small step for
> (a) man, one giant leap for mankind."
>
> Then the satellite went below the horizon and the signal faded into the
> noise.
>
> Was this to mark the 25th anniversary of the moon landing or was someone
> in VK playing tricks?
>
> If the former, then the audio must have been digitally encoded and sent
> to the satellite for playback - another amazing function of the onboard
> DSP.
>
It was spouting all sorts of things to do with the 25th anniversary. I
heard what sounded like fax and packet as well.

Dave

--
Dave Hough
dave@sectel.com
Tel +44 285 655 766 Fax +44 285 655 595

1166. UO-sats.

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 17:56:00 UTC
From: st3qi@elroy.uh.edu
Message-ID: <25JUL199412564073@elroy.uh.edu>
Source record: 27120

Does anyone have a FAQ for the OSCARs? I would like to work them
but I don't have much literature on them. Thanks.

If you have a copy, please end it to st3qi@jetosn.uh.edu. Thanks!

--
Brad A. Killebrew N5LJV, EMT-B | Student of Computer Engr Technology
President, University of Houston ARC | University of Houston, Texas
Internet: st3qi@jetson.uh.edu | U of H Amateur Radio Club WB5FND
AmprNet : n5ljv@sugarland.ampr.org | uharc@post-office.uh.edu
Packet : n5ljv@f6cnb.#setx.tx.usa.na | 713-743-4070 Fax 743-4032
AT&Tnet : 713-852-8523 Fax 852-2630 | Box 85-T2, 4800 Calhoun, 77204-4083

1167. Appollo freq's

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 22:02:56 UTC
From: mgalatz@panix.com
Message-ID: <mgalatz.1125561416B@198.7.0.1>
Source record: 27122

What frequencies were used during the Appollo missions for voice and video?
How long did it take to reach Earth from the Moon?

1168. RE: Jupiter Pictures

Newsgroup: rec.radio.amateur.space
Date: 1994-07-25 22:15:00 UTC
From: MUENZLERK@uthscsa.EDU
Message-ID: <2E3439DD@msmail.uthscsa.edu>
Source record: 27121

carrl@gordon-tsd1.army.mil asks:

>Where is best place to download pictures of comets hitting
>jupiter? thks,
>carrl@gordon-tsd1.army.mil

If you have MOSAIC you can get to MEGABYTES of pictures and animated
stuff at:
http://marvel.stsci.edu/EPA/Comet.html (case sensitive)

you ftp the pictures from
marvel.stsci.edu

Kevin

Legal stuff:
The above opinions are my own and not necessarily those of the staff,
faculty, administration, or lab animals (woof!) of The University of
Texas Health Science Center at San Antonio or anyone else who is not
me.

Kevin R. Muenzler, WB5RUE The University of Texas Health
muenzlerk@uthscsa.edu Science Center at San Antonio,
Department of Computing Resources

** There is no such thing as a Monkey-Proof Program! **
** I can prove it! **

1169. Two-Line Orbital Element Sets (TLE437)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 01:17:00 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.775185420@afit.af.mil>
Source record: 27124

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #437 -
Alouette 1
1 00424U 62049 94202.14106440 .00000043 00000-0 40192-4 0 121
2 00424 80.4640 251.5018 0023999 30.5092 329.7439 13.67815130587043
ATS 1
1 02608U 66110A 94197.70334212 -.00000315 00000-0 10000-3 0 8872
2 02608 14.5731 0.1254 0010279 46.5443 80.1846 1.00367428 17765
ATS 3
1 03029U 67111A 94205.56832687 -.00000130 00000-0 10000-3 0 2212
2 03029 14.6779 7.0937 0009226 265.7550 128.5961 1.00273250 97812
Cosmos 398
1 04966U 71016A 94206.12335074 .00097066 76298-5 18468-3 0 3883
2 04966 51.4325 180.0020 0992482 117.3638 253.2512 13.96380736778032
Starlette
1 07646U 75010A 94201.98869408 -.00000158 00000-0 -10156-4 0 7995
2 07646 49.8257 19.9701 0205867 87.8744 274.5707 13.82186304982527
LAGEOS
1 08820U 76039A 94206.00054399 -.00000006 00000-0 10000-3 0 143
2 08820 109.8207 148.5484 0044351 277.1894 82.3624 6.38664317169562
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94201.41926848 .00000055 00000-0 00000+0 0 3726
2 10061 11.2605 45.3065 0001692 7.8261 259.5668 1.00279284 7449
IUE
1 10637U 78012A 94202.44587725 -.00000304 00000-0 10000-3 0 201
2 10637 34.6500 94.3226 1316945 36.9889 277.9075 1.00257039 13069
GPS BI-01
1 10684U 78020A 94205.59628876 -.00000040 00000-0 10000-3 0 2843
2 10684 64.6438 44.4003 0061758 163.8255 196.3650 1.98069076105679
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GPS BI-02
1 10893U 78047A 94204.45890739 -.00000022 00000-0 10000-3 0 856
2 10893 63.5267 283.2651 0215175 13.8165 346.8118 2.01627369118809
GOES 3
1 10953U 78062A 94203.75955086 .00000037 00000-0 10000-3 0 3374
2 10953 10.2001 48.0668 0005944 67.3780 281.9279 1.00252683 12074
SeaSat 1
1 10967U 78064A 94206.17212704 -.00000004 00000-0 43287-4 0 3091
2 10967 108.0020 180.8192 0002503 246.0274 114.0602 14.37968752841829
GPS BI-03
1 11054U 78093A 94205.45543220 -.00000023 00000-0 10000-3 0 2019
2 11054 63.2553 280.6575 0044638 178.1424 181.9491 1.93505928115239
Nimbus 7
1 11080U 78098A 94202.15143920 -.00000088 00000-0 -41198-4 0 4129
2 11080 99.0491 84.5073 0009834 43.2679 316.9245 13.83729120794776
GPS BI-04
1 11141U 78112A 94205.68739999 -.00000040 00000-0 00000+0 0 8990
2 11141 64.6513 45.6907 0049111 26.2782 334.0255 1.92894736 4509
GPS BI-05
1 11690U 80011A 94200.82030777 -.00000010 00000-0 10000-3 0 8092
2 11690 65.0336 46.3066 0142607 197.1695 162.4094 2.00557802120193
GPS BI-06
1 11783U 80032A 94202.40140384 -.00000008 00000-0 10000-3 0 9896
2 11783 62.6353 277.0763 0210543 29.2556 331.9944 2.03456665104659
GOES 5
1 12472U 81049A 94201.84062326 -.00000005 00000-0 10000-3 0 7780
2 12472 6.8935 57.6401 0006855 19.2043 39.9441 1.00329637 6103
Cosmos 1383
1 13301U 82066A 94201.74728163 .00000021 00000-0 77805-5 0 3106
2 13301 82.9314 285.1485 0028219 5.4544 354.6909 13.68056799602013
LandSat 4
1 13367U 82072A 94205.14313987 .00000027 00000-0 16016-4 0 5123
2 13367 98.1752 263.0138 0007632 132.7451 227.4391 14.57121725639447
IRAS
1 13777U 83004A 94205.52849392 .00000276 00000-0 22040-3 0 6591
2 13777 98.9696 35.7006 0012097 206.8908 153.1642 13.99206670256364
Cosmos 1447
1 13916U 83021A 94201.90336448 .00000020 00000-0 57014-5 0 4110
2 13916 82.9469 346.7571 0036898 297.2475 62.4923 13.74312202567967
TDRS 1
1 13969U 83026B 94200.74086416 -.00000214 00000-0 10000-4 0 3186
2 13969 7.7647 50.7608 0007196 79.8138 158.7531 1.00273145 14374
GOES 6
1 14050U 83041A 94206.12863847 -.00000006 00000-0 10000-3 0 2406
2 14050 5.6964 60.6785 0004706 358.9787 168.3414 1.00225899 13162
OSCAR 10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 55387
LandSat 5
1 14780U 84021A 94205.18061642 .00000014 00000-0 13020-4 0 1002
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2 14780 98.1626 264.2061 0005228 134.4700 225.6926 14.57141458552869
UoSat 2
1 14781U 84021B 94199.48919451 .00000098 00000-0 24462-4 0 7086
2 14781 97.7853 212.7468 0011606 164.4932 195.6634 14.69230442554907
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94197.57274043 .00000035 00000-0 21262-4 0 6080
2 15055 82.9547 43.3798 0028121 131.7651 228.5907 13.73608265504660
GPS BI-10
1 15271U 84097A 94205.53665967 -.00000019 00000-0 10000-3 0 8254
2 15271 62.3460 277.0501 0147179 348.9588 10.8047 2.00583068 71353
Cosmos 1602
1 15331U 84105A 94199.51711256 .00000304 00000-0 33076-4 0 3007
2 15331 82.5320 48.3912 0021795 96.8824 263.4873 14.84432339529160
NOAA 9
1 15427U 84123A 94205.75530606 .00000064 00000-0 58144-4 0 8882
2 15427 99.0480 256.6794 0015740 111.3123 248.9729 14.13630343495567
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94204.92312268 .00002226 00000-0 37433-4 0 6898
2 16609 51.6480 2.6272 0002451 168.9704 191.1321 15.56655252481748
SPOT 1
1 16613U 86019A 94205.76495663 .00000090 00000-0 62356-4 0 7057
2 16613 98.6876 278.7324 0001359 119.9926 240.1387 14.20362066121897
Cosmos 1766
1 16881U 86055A 94196.75876585 .00000255 00000-0 27991-4 0 2153
2 16881 82.5197 108.9713 0020135 128.0111 232.2916 14.83458693429698
EGP
1 16908U 86061A 94205.98596880 -.00000097 00000-0 00000+0 0 9095
2 16908 50.0122 328.1909 0011342 50.3986 309.7849 12.44409967 30098
NOAA 10
1 16969U 86073A 94205.72541237 .00000064 00000-0 45523-4 0 7841
2 16969 98.5088 213.5822 0012601 216.9937 143.0375 14.24899133407841
MOS-1
1 17527U 87018A 94205.21118173 .00000091 00000-0 99794-4 0 971
2 17527 99.0309 273.1220 0001184 107.3361 252.7931 13.94909349378105
GOES 7
1 17561U 87022A 94203.39036747 -.00000063 00000-0 10000-3 0 9350
2 17561 1.6237 75.2922 0004645 353.7497 258.7365 1.00270085 10320
Kvant-1
1 17845U 87030A 94204.85892749 .00000030 00000-0 72199-5 0 9226
2 17845 51.6473 2.9510 0002265 160.8879 199.2203 15.56649470481820
DMSP B5D2-3
1 18123U 87053A 94205.76108695 .00000033 00000-0 39227-4 0 5742
2 18123 98.7861 36.9054 0015185 72.6995 287.5841 14.15365798366404
RS-10/11
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1 18129U 87054A 94205.76394677 .00000021 00000-0 61233-5 0 9290
2 18129 82.9269 301.0678 0010302 284.6472 75.3539 13.72339428355066
Meteor 2-16
1 18312U 87068A 94204.37704448 .00000037 00000-0 20207-4 0 3090
2 18312 82.5533 183.1521 0013415 17.7090 342.4539 13.84034062350067
Meteor 2-17
1 18820U 88005A 94205.52370879 .00000033 00000-0 16111-4 0 3467
2 18820 82.5410 238.8830 0018404 75.4598 284.8608 13.84718856327524
DMSP B5D2-4
1 18822U 88006A 94205.54111629 .00002024 00000-0 91725-3 0 6837
2 18822 98.4363 58.9533 0005569 232.3915 127.6754 14.22981025335916
Glonass 34
1 19163U 88043A 94205.49150569 -.00000003 00000-0 10000-3 0 9079
2 19163 65.0392 109.1934 0007170 158.4643 201.6117 2.13102340 47454
Glonass 36
1 19165U 88043C 94204.60881863 -.00000007 00000-0 10000-3 0 3013
2 19165 65.0144 109.1944 0004267 323.0447 36.9646 2.13102200 48056
METEOSAT 3
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IO-26
1 22826U 93061D 94197.16066415 .00000010 00000-0 21762-4 0 3052
2 22826 98.6521 272.7178 0009803 121.7855 238.4287 14.27733649 41821
HEATHSAT
1 22827U 93061E 94197.20911066 .00000018 00000-0 25005-4 0 3679
2 22827 98.6499 272.7331 0009645 107.9918 252.2306 14.27845139 41832
PO-28
1 22829U 93061G 94197.66078408 .00000024 00000-0 27399-4 0 2983
2 22829 98.6462 273.2405 0010944 108.5827 251.6545 14.28033511 41902
KO-25
1 22830U 93061H 94206.20302620 -.00000021 00000-0 88397-5 0 3134
2 22830 98.5527 278.5145 0012526 66.4100 293.8394 14.28060612 43126
GPS BIIA-23
1 22877U 93068A 94202.16569898 -.00000037 00000-0 10000-3 0 1460
2 22877 55.2122 77.0737 0032211 289.1238 70.5721 2.00573213 5413
METEOSAT 6
1 22912U 93073B 94200.14487580 -.00000091 00000-0 00000+0 0 1093
2 22912 0.8290 267.1875 0002105 244.8937 187.3553 1.00275201 840
HST Array
1 22920U 90037C 94204.52995099 .00004028 00000-0 32669-3 0 1727
2 22920 28.4740 350.8044 0004349 277.6863 82.3136 14.97192278 34948
Meteor 3-6
1 22969U 94003A 94199.54384187 .00000051 00000-0 10000-3 0 795
2 22969 82.5574 34.1315 0015004 182.1965 177.9032 13.16723542 22973
TUBSAT-B
1 22970U 94003B 94198.01083128 .00000051 00000-0 10000-3 0 698
```

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2 22970 82.5579 35.1937 0015456 183.1369 176.9618 13.16822353 22778
ODERACS A
1 22990U 94006B 94203.28044901 .00069742 12394-4 18221-3 0 1346
2 22990 56.9809 164.1029 0004219 220.0858 139.9897 15.95189755 25766
ODERACS B
1 22991U 94006C 94203.07595227 .00069560 12357-4 18753-3 0 1264
2 22991 56.9797 165.5452 0004230 207.3721 152.6809 15.94606913 25728
ODERACS E
1 22994U 94006F 94205.88953878 .00018688 00000-0 88919-4 0 992
2 22994 56.9810 158.4941 0008003 230.5860 129.4309 15.83008492 26088
ODERACS F
1 22995U 94006G 94204.87527819 .00020761 00000-0 97764-4 0 1302
2 22995 56.9812 163.0844 0007320 221.8011 138.2490 15.83156223 25924
BREMSAT
1 22998U 94006H 94205.98263487 .00020394 00000-0 99047-4 0 1124
2 22998 56.9906 159.1212 0003822 221.6392 138.4385 15.82528056 25931
GPS BIIA-24
1 23027U 94016A 94203.74156241 -.00000081 00000-0 00000+0 0 723
2 23027 54.9640 18.0621 0062240 191.5045 168.3563 2.00560872 2757
Glonass 62
1 23043U 94021A 94203.63307089 -.00000082 00000-0 00000+0 0 690
2 23043 64.8091 348.1470 0006558 177.0263 182.9710 2.13102778 2189
Glonass 63
1 23044U 94021B 94205.39300626 -.00000081 00000-0 00000+0 0 527
2 23044 64.8024 348.0810 0029198 200.7273 159.1484 2.13102709 2226
Glonass 64?
1 23045U 94021C 94205.55468750 -.00000081 00000-0 00000+0 0 608
2 23045 64.7847 348.0820 0002004 339.2968 21.2844 2.12796740 2228
GOES 8
1 23051U 94022A 94205.51955924 -.00000201 00000-0 00000+0 0 1386
2 23051 0.3697 264.8976 0001775 280.2435 213.6647 1.00278030 677
STRV-1A
1 23125U 94034B 94198.34040758 -.00000143 00000-0 -13209-3 0 185
2 23125 7.0042 173.3982 7278357 202.2441 94.4678 2.27297944 694
STRV-1B
1 23126U 94034C 94204.98615661 .00000072 00000-0 15639-3 0 206
2 23126 6.9962 170.8027 7281209 207.4731 79.3962 2.26906100 840
1994035B
1 23133U 94035B 94205.47769488 .00041995 00000-0 12839-2 0 406
2 23133 26.9527 272.1109 5373996 224.4490 77.1707 5.10700927 1555
1994032D
1 23134U 94032D 94206.08663205 .23033484 -88054-6 10420-2 0 610
2 23134 82.5629 340.2992 0025531 331.4848 45.9842 16.40066495 7621
1994032H
1 23138U 94032H 94206.25295853 .00146669 83105-5 16257-3 0 613
2 23138 82.5830 339.2662 0047486 310.3556 49.3410 16.07022811 7688
Soyuz TM-19
1 23139U 94036A 94204.85892749 .00000030 00000-0 72199-5 0 347
2 23139 51.6473 2.9510 0002265 160.8879 199.2203 15.56649470 3508
1994033D
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1 23142U 94033D 94205.54558870 .00459730 80402-4 18829-2 0 451
2 23142 62.8068 301.3918 0067946 16.8521 343.4897 15.82069448 6319
1994033E
1 23143U 94033E 94205.45386183 .00093959 81973-5 10000-3 0 331
2 23143 62.8113 298.0982 0069978 108.3731 252.5054 16.04943434 6362
FSW 2
1 23145U 94037A 94205.94282817 .00143561 79456-5 17111-3 0 563
2 23145 62.9563 263.7211 0117545 153.6498 207.0226 15.95728382 3461
Cosmos 2282
1 23168U 94038A 94203.93190410 -.00000206 00000-0 00000+0 0 291
2 23168 2.2883 291.9723 0006940 303.3678 16.0492 1.00281274 206
1994038D
1 23171U 94038D 94205.38167119 -.00000265 00000-0 10000-3 0 94
2 23171 2.3114 292.1254 0019992 6.3142 89.5543 0.99430715 178
1994038E
1 23172U 94038E 94204.26540211 .00001371 00000-0 96448-3 0 121
2 23172 47.8280 287.9007 7285663 4.0374 359.6117 2.25483434 9303
STS 65
1 23173U 94039A 94204.25000000 .00008687 -72819-5 59430-5 0 514
2 23173 28.4633 258.7068 0005538 90.0887 35.3607 16.10941247 2329
1994038F
1 23174U 94038F 94189.63147236 .03238761 00000-0 59326+1 0 35
2 23174 47.9544 291.8792 7263552 0.3524 359.9234 2.24222805 8981
PANAMSAT 2
1 23175U 94040A 94204.38990936 .00000101 00000-0 10000-4 0 269
2 23175 0.0427 327.9371 0035522 125.2889 183.1473 1.00277586 189
BS-3N
1 23176U 94040B 94204.39378329 -.00000374 00000-0 10000-4 0 181
2 23176 0.2301 276.0589 0016797 86.2101 199.8397 1.00526334 169
1994040C
1 23177U 94040C 94205.10999812 .00000142 00000-0 47976-3 0 114
2 23177 7.5467 82.0384 7294971 191.5932 131.1977 2.20411703 318
SPELDA
1 23178U 94040D 94203.72032864 .00036041 00000-0 57874-2 0 154
2 23178 7.0069 83.7040 7285829 189.2050 140.6724 2.28830388 290
NADEZHDA 4
1 23179U 94041A 94197.89505807 .00000564 00000-0 56661-3 0 52
2 23179 82.9461 36.3561 0034990 283.0314 76.6936 13.75656613 374
1994041B
1 23180U 94041B 94204.86667058 .00001551 00000-0 15471-2 0 114
2 23180 82.9451 31.1750 0027708 261.9536 97.8360 13.77222276 1337
1994042A
1 23182U 94042A 94206.25595014 .00242106 57022-5 12884-3 0 125
2 23182 67.1183 173.0441 0128351 101.1900 255.3492 16.03525405 737
1994042B
1 23183U 94042B 94206.22891619 .04248859 61726-5 19419-3 0 226
2 23183 67.0854 172.9740 0054036 87.2039 274.0594 16.34852764 733
1994042C
1 23184U 94042C 94202.34492184 .10824003 58503-5 22539-2 0 54
2 23184 67.0746 186.3962 0082002 97.6891 277.6183 16.21548842 103
```

1994043A
1 23185U 94043A 94205.61774306 -.00000213 00000-0 00000+0 0 80
2 23185 0.2990 146.9719 0729133 122.5316 82.1313 0.91181188 75
1994043B
1 23186U 94043B 94205.35733089 .00002025 -49268-7 95063-4 0 93
2 23186 26.7410 92.8398 7623066 179.7157 182.1393 1.89751268 79
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1170. Re: AO-27, UO-11, UO-15, AO-21 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 05:25:18 UTC
From: mikec@comtch.iea.com
Message-ID: <3126nu$kcu@krel.iea.com>
Source record: 27123

: Your observation of the type of operation on AO-27 is accurate. I used to
: work it from my mobile station, but have had to give it up due to the
: large number of high power base stations with large uplink beams using it
: for passing recipes etc. On the rare occasions when this satellite is
: not cluttered, 4 W talkies with rubber duckies can work each other.

I don't work AO-27 much..

: AO-21 is much worse because it has been around longer. The regulars on
: this one use 40 el uplink beams and 1 KW plus amplifiers. The downlink
: is 145.987 Mhz FM and the uplink is 435.016 Mhz FM.

C'mon.. that's a bit of a stretch.. Most satellite stations, mine
included run 50-70 watts uplink into a regular satellite antenna
of about 9 elements. Get real, you _can_ work this bird with a
handheld, but when you have a nice satellite setup, the handheld
doesn't cut it.. Even I have trouble with AO-21 from time to
time, so the secret to working this bird is keep trying! I have
called CQ on 21 and nobody answered - just the right (wrong) time
of day and nobody was on but me, and that's what I call having your
own satellite :-)

: For info on the other birds you mightr pick up a copy of "The Satellite
: Experimenters Handbook".

Good idea!
--
- - - - - - - - - - - - mikec@comtch.iea.com - - - - - - - - - - - - - - -

Michael B. Candy Amateur Radio Call: KI7FX
P.O. Box 1953 KI7FX@KA7FVV.#EWA.WA.USA.NA
Airway Hts, WA. 99001-1953 American Digital Radio Society

1171. Thanks

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 14:16:15 UTC
From: carrl@gordon-tsd1.army.mil
Message-ID: <9407261416.AA11348@gordon-tsd1.army.mil>
Source record: 27125

Thanks to all who responded to my request for pics of comets hitting
Jupiter. Best place is marvel.stsci.edu Great stuff.
carrl@gordon-tsd1.army.mil

1172. Re: Appollo freq's

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 21:47:21 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Jul26.214721.27045@gov.nt.ca>
Source record: 27126

In article <mgalatz.1125561416B@198.7.0.1> mgalatz@panix.com (Menachem Galatz DC) writes:
>What frequencies were used during the Appollo missions for voice and video?
>How long did it take to reach Earth from the Moon?

I have also heard that there were amateurs monitoring these comms as
well. I've often wondered what the time delay was as it is not
noticible in recordings of the missions shown on TV. Anyone have the
info?

==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

1173. Portable 9600 buad PacSat Station Design

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 22:14:54 UTC
From: Ron.Parsons@f40.n382.z1.fidonet.org
Message-ID: <775267223.AA01262@afarm.uucp>
Source record: 27129

I am a self-confessed Mac bigot but I must state that I have found no Mac satellite software tha handles the PacSat Broadcast Protocol. I ftp'ed the "Broadcast" program from ftp.demon.co.uk /pub/ham/mac but it is very old, and would crash with a System Error under System 7.1 on a Quadra 700.

The program that Gilbert Macklin did was receive-only and he is currently working on a up/download version, but is not nearly done. And these programs lack the scheduling features of WiSP or SatSked.

I was forced to put the Apple 486 card in my Quadra just to run Windows and WiSP.

I would be pleased to know of some working Broadcast Protocol and scheduling software for the Mac.

Ron W5RKN

1174. Re: Appollo freq's

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 23:24:03 UTC
From: kilgore@wichita.tivoli.com
Message-ID: <3145uj$lo0@tivoli.tivoli.com>
Source record: 27128

In article <1994Jul26.214721.27045@gov.nt.ca>, ve8ev@gov.nt.ca (John Boudreau) writes:
|> In article <mgalatz.1125561416B@198.7.0.1> mgalatz@panix.com (Menachem Galatz DC) writes:
|> >What frequencies were used during the Appollo missions for voice and video?
|> >How long did it take to reach Earth from the Moon?
|>
|> I have also heard that there were amateurs monitoring these comms as
|> well. I've often wondered what the time delay was as it is not
|> noticible in recordings of the missions shown on TV. Anyone have the
|> info?
|>
|> ==
|> John Boudreau VE8EV INTERNET: ve8ev@amsat.org
|> Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
|> ==
|>

Actually, the time delay was noticeable as the Apollo spacecraft neared the moon. It takes about 1.3 seconds for the signal to reach Earth from the moon, so there are noticeable pauses (>2.6 seconds) in the communications.

Jeff, KC1MK

1175. Comet images from NSSDC

Newsgroup: rec.radio.amateur.space
Date: 1994-07-26 23:59:00 UTC
From: towheed@nssdca.gsfc.nasa.gov
Message-ID: <26JUL199419592432@nssdca.gsfc.nasa.gov>
Source record: 27127

NSSDC HANDLES RECORD-BREAKING DEMAND FOR JUPITER COMET IMPACT IMAGES

The National Space Science Data Center (NSSDC) at NASA's Goddard Space Flight Center is pleased to announces the availability of the latest Comet P/Shoemaker-Levy 9 (SL-9) impact images taken by the Hubble Space Telescope, Keck telescope, Calar Alto, European Southern, La Palma, MSSSO, etc.

NSSDC staff gathered close to 200 observations and associated results from around the world and made them available using the NSSDC World Wide Web (WWW) service.

The effort demonstrates, for the first time, the "real world" use of the World Wide Web infrastructure for the massive and almost real-time access to NASA data. It also demonstrates how rapidly information systems can be tailored to resource constraints and user demands.

We have been inundated with note of appreciation from a broad range of users. Thanks you all for the constant feedback and bug reports! I am humbled by knowing that you are so impressed with our service. It's been a very, very busy week and I want to use this chance to thanks you all allowing us to serve you. By the way, keep us on your hotlist for the Apollo 25 pages.

SUMMARY FOR ACCESS TO NSSDC SL-9 WWW SYSTEM

Covers : Mon Jul 18 12:00:00 AM -- Tue Jul 26 14:29:27 PM EDT 1994
Total Access : 339,907
Peak Hourly Access : 5,904 (Thu Jul 21 2:00 PM EDT 1994)
Peak Daily Access : 73,557 (Thu Jul 21 1994)

The SL-9 data and information system can be accessed using the World Wide Web (WWW). The URL is below.

http://www.gsfc.nasa.gov/planetary/COMET.HTML

Regards,

Syed S. Towheed
Systems Programmer
Hughes STX Corp.

>>
National Space Science Data Center Phone:(301)286-4136
NASA Goddard Space Flight Center Fax:(301)286-1771
Greenbelt, MD 20771, USA E-mail:towheed@nssdca.gsfc.nasa.gov

http://www.gsfc.nasa.gov/nssdc/nssdc_home.html
>>> Syed S. Towheed >>>>>>>>

1176. Internet Offers Space Station Petition

Newsgroup: rec.radio.amateur.space
Date: 1994-07-27 22:45:04 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <316o1g$3k3@news.CCIT.Arizona.EDU>
Source record: 27130

Dear Colleague:

Student Space Action, a national organization of students dedicated to the preservation of space exploration, would like to inform you of a way in which you can directly voice your support for the space program. Initially, our focus will be on the space station, but we plan to branch out into areas such as manned and unmanned programs, SSRT technology and other areas of interest involving NASA and our national space effort as the organization strengthens. Just this past June, members of Student Space Action traveled to Washington, D.C. and helped in the successful lobbying of Congress in support of the space station. While we were successful this year, we can not sit back and wait for next year's vote, we must press ahead.

If you believe the space program is a vital part of our country's future, both in economic growth and technological advancement, then sign the Student Space Action's Interactive Petition. You can tell your elected officials exactly how much you support the space program by signing the petition. Simply follow these steps:

Telnet seds.lpl.arizona.edu
login> space

After you submit the petition, you will receive information on your Representatives so you can contact them further by phone or mail if you desire.

The petition is also accessible through the World Wide Web. Simply go to the following URL and follow the directions:

URL: http://seds.lpl.arizona.edu/ssa/petition.html

Answer the questions and submit the petition and you will receive the same information as the telnet version. You will also have the option of linking to the space station home page where you can read up-to-date information on the space station, including issues of "Space Station This Week."

If you believe that NASA should remain as an engine for continued space exploration, then tell everyone you know to sign this petition.

Please forward this message to anyone you may feel would want to be a part of this effort.

SPACE STATION: IT'S ABOUT LIFE ON EARTH!!

If you believe that our government, by supporting an initiative like
the space station, is making an investment in the future generation
of this great nation, then send your message to Washington by
signing the Student Space Action Interactive Petition.

Your voice does count! And it WILL make a difference!

Sincerely,

--
Student Space Action
"Don't Take Away Our Frontier!"
For general responses: ssa@seds.lpl.arizona.edu
For technical or policy inquiries: chrisl@bozo.lpl.arizona.edu
or gamageb@db.erau.edu
We will keep reaching for the stars....

1177. Re: Giant leap via AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 13:58:41 UTC
From: magliaco@pilot.njin.net
Message-ID: <Jul.29.09.58.41.1994.22857@pilot.njin.net>
Source record: 27134

In article <30uuo8$reb@aggedor.rmit.EDU.AU>, david@pitvax.xx.rmit.edu.au writes:
> I heard an unusual message transmitted by AO-21 on a short, low elevation
> pass this weekend, on the 70cm - 2m FM translator output.
>
> It was unmistakable - Neil Armstrongs immortal words "One small step for
> (a) man, one giant leap for mankind."
>
> Then the satellite went below the horizon and the signal faded into the
> noise.
>
> Was this to mark the 25th anniversary of the moon landing or was someone
> in VK playing tricks?
>

Apparently, not enough people read SpaceNews :-)

* AMSAT-OSCAR-21 NEWS *
==========
At 16:17:43 EDT (20:17:43 UTC), Sunday afternoon, July 20, 1969, astronaut
Neil A. Armstrong spoke the words:

"Houston, Tranquility Base here. The Eagle has landed."

At 20:56 EDT, later the same day, Armstrong stepped down from the ladder
of the Lunar Module onto the Moon's surface and said:

"That's one small step for (a) man, one giant leap for mankind."

Edwin Aldrin followed him about 15 Minutes later, while Michael Collins
orbited the Moon with the APOLLO-11 Command and Service Module at an
altitude of 100 kilometers.

To commemorate the anniversary of this historic event, a special Multi-Media
Broadcast has been uploaded into the RUDAK system on the AMSAT-OSCAR-21
satellite that includes the historic words and the APOLLO-11 logo in APT
FAX format.

AMSAT-OSCAR-21's RUDAK downlink is a frequency of 145.987 MHz and can be
received anywhere in the world using a narrowband FM receiver when the
satellite is above the local horizon.

[Info via Peter, DB2OS, on behalf of AMSAT-DL and AMSAT-Russia]

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net

Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..
--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1178. orbs$210.oscar.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 14:57:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-210.o.1994@ampr.org>
Source record: 27131
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-210.O
Orbital Elements 210.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX July 29, 1994
BID: $ORBS-210.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94195.81899517
Element set: 290
Inclination: 27.0497 deg
RA of node: 317.9184 deg
Eccentricity: 0.6025942
Arg of perigee: 194.3808 deg
Mean anomaly: 135.3303 deg
Mean motion: 2.05882029 rev/day
Decay rate: -2.39e-06 rev/day^2
Epoch rev: 8335
Checksum: 326

Satellite: UO-11
Catalog number: 14781
Epoch time: 94206.57201705
Element set: 711
Inclination: 97.7853 deg
RA of node: 219.4981 deg
Eccentricity: 0.0012287
Arg of perigee: 142.1150 deg
Mean anomaly: 218.0921 deg
Mean motion: 14.69232874 rev/day
Decay rate: 1.26e-06 rev/day^2
Epoch rev: 55594
Checksum: 303

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94205.76394677
Element set: 929
Inclination: 82.9269 deg
RA of node: 301.0678 deg
Eccentricity: 0.0010302
Arg of perigee: 284.6472 deg
```

Mean anomaly: 75.3539 deg
Mean motion: 13.72339428 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 35506
Checksum: 320

Satellite: AO-13
Catalog number: 19216
Epoch time: 94205.91938835
Element set: 935
Inclination: 57.7565 deg
RA of node: 240.1864 deg
Eccentricity: 0.7222231
Arg of perigee: 346.4624 deg
Mean anomaly: 1.6687 deg
Mean motion: 2.09718427 rev/day
Decay rate: 2.74e-06 rev/day^2
Epoch rev: 4680
Checksum: 323

Satellite: FO-20
Catalog number: 20480
Epoch time: 94206.26040988
Element set: 708
Inclination: 99.0420 deg
RA of node: 350.8957 deg
Eccentricity: 0.0539824
Arg of perigee: 253.2264 deg
Mean anomaly: 100.8961 deg
Mean motion: 12.83226193 rev/day
Decay rate: -5.1e-07 rev/day^2
Epoch rev: 20901
Checksum: 297

Satellite: AO-21
Catalog number: 21087
Epoch time: 94208.21479316
Element set: 493
Inclination: 82.9441 deg
RA of node: 113.0988 deg
Eccentricity: 0.0035418
Arg of perigee: 335.1148 deg
Mean anomaly: 24.8298 deg
Mean motion: 13.74542430 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 17508
Checksum: 307

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94205.88513475

Element set: 711
Inclination: 82.9215 deg
RA of node: 343.4852 deg
Eccentricity: 0.0030108
Arg of perigee: 6.5069 deg
Mean anomaly: 353.6469 deg
Mean motion: 13.74044138 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 17382
Checksum: 300

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94205.08601395
Element set: 267
Inclination: 1.9520 deg
RA of node: 97.7392 deg
Eccentricity: 0.2917162
Arg of perigee: 186.8922 deg
Mean anomaly: 167.2050 deg
Mean motion: 1.42201946 rev/day
Decay rate: -1.42e-06 rev/day^2
Epoch rev: 172
Checksum: 281

/EX

1179. orbs$210.micro.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 14:59:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-210.d.1994@ampr.org>
Source record: 27133
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-210.D
Orbital Elements 210.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX July 29, 1994
BID: $ORBS-210.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94206.22284695
Element set: 13
Inclination: 98.5894 deg
RA of node: 290.4825 deg
Eccentricity: 0.0012008
Arg of perigee: 78.9012 deg
Mean anomaly: 281.3516 deg
Mean motion: 14.29850235 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 23502
Checksum: 291

Satellite: AO-16
Catalog number: 20439
Epoch time: 94206.20702088
Element set: 811
Inclination: 98.5977 deg
RA of node: 291.7399 deg
Eccentricity: 0.0012239
Arg of perigee: 79.4923 deg
Mean anomaly: 280.7641 deg
Mean motion: 14.29904338 rev/day
Decay rate: 3.0e-08 rev/day^2
Epoch rev: 23503
Checksum: 318

Satellite: DO-17
Catalog number: 20440
Epoch time: 94206.22761656
Element set: 812
Inclination: 98.5991 deg
RA of node: 292.0970 deg
Eccentricity: 0.0012389
Arg of perigee: 78.8466 deg
```

Mean anomaly: 281.4111 deg
Mean motion: 14.30043974 rev/day
Decay rate: -4.0e-08 rev/day^2
Epoch rev: 23505
Checksum: 302

Satellite: WO-18
Catalog number: 20441
Epoch time: 94205.78381851
Element set: 814
Inclination: 98.5990 deg
RA of node: 291.6570 deg
Eccentricity: 0.0012956
Arg of perigee: 80.7533 deg
Mean anomaly: 279.5114 deg
Mean motion: 14.30018047 rev/day
Decay rate: -4.0e-08 rev/day^2
Epoch rev: 23499
Checksum: 314

Satellite: LO-19
Catalog number: 20442
Epoch time: 94206.24921416
Element set: 810
Inclination: 98.5996 deg
RA of node: 292.3827 deg
Eccentricity: 0.0013298
Arg of perigee: 79.1581 deg
Mean anomaly: 281.1094 deg
Mean motion: 14.30114763 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 23507
Checksum: 299

Satellite: UO-22
Catalog number: 21575
Epoch time: 94205.73789110
Element set: 515
Inclination: 98.4330 deg
RA of node: 279.4738 deg
Eccentricity: 0.0007454
Arg of perigee: 171.9232 deg
Mean anomaly: 188.2073 deg
Mean motion: 14.36924859 rev/day
Decay rate: 1.8e-07 rev/day^2
Epoch rev: 15847
Checksum: 328

Satellite: KO-23
Catalog number: 22077
Epoch time: 94206.41547975

Element set: 410
Inclination: 66.0810 deg
RA of node: 199.9404 deg
Eccentricity: 0.0015234
Arg of perigee: 277.3412 deg
Mean anomaly: 82.5876 deg
Mean motion: 12.86286814 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9170
Checksum: 310

Satellite: AO-27
Catalog number: 22825
Epoch time: 94206.22287297
Element set: 308
Inclination: 98.6518 deg
RA of node: 281.6465 deg
Eccentricity: 0.0009366
Arg of perigee: 94.4271 deg
Mean anomaly: 265.7975 deg
Mean motion: 14.27629859 rev/day
Decay rate: -1.4e-07 rev/day^2
Epoch rev: 4311
Checksum: 339

Satellite: IO-26
Catalog number: 22826
Epoch time: 94206.20110340
Element set: 308
Inclination: 98.6520 deg
RA of node: 281.6684 deg
Eccentricity: 0.0010136
Arg of perigee: 97.7120 deg
Mean anomaly: 262.5225 deg
Mean motion: 14.27734369 rev/day
Decay rate: -5.0e-08 rev/day^2
Epoch rev: 4311
Checksum: 270

Satellite: KO-25
Catalog number: 22830
Epoch time: 94206.20302620
Element set: 313
Inclination: 98.5527 deg
RA of node: 278.5145 deg
Eccentricity: 0.0012526
Arg of perigee: 66.4100 deg
Mean anomaly: 293.8394 deg
Mean motion: 14.28060612 rev/day
Decay rate: -2.1e-07 rev/day^2
Epoch rev: 4312

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Checksum: 259

/EX
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1180. orbs$210.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 15:03:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-210.w.1994@ampr.org>
Source record: 27139
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-210.W
Orbital Elements 210.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX July 29, 1994
BID: $ORBS-210.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94209.86049340
Element set: 894
Inclination: 99.0483 deg
RA of node: 260.8324 deg
Eccentricity: 0.0015771
Arg of perigee: 100.2990 deg
Mean anomaly: 259.9957 deg
Mean motion: 14.13631184 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 49614
Checksum: 325

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94209.93863882
Element set: 790
Inclination: 98.5068 deg
RA of node: 217.6655 deg
Eccentricity: 0.0012694
Arg of perigee: 204.4999 deg
Mean anomaly: 155.5579 deg
Mean motion: 14.24899864 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 40844
Checksum: 375

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94208.55852336
Element set: 349
Inclination: 82.5407 deg
RA of node: 236.4684 deg
Eccentricity: 0.0018481
Arg of perigee: 68.3344 deg
```

Mean anomaly: 291.9792 deg
Mean motion: 13.84719050 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 32794
Checksum: 332

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94205.76914298
Element set: 306
Inclination: 82.5410 deg
RA of node: 297.0872 deg
Eccentricity: 0.0016655
Arg of perigee: 164.4493 deg
Mean anomaly: 195.7144 deg
Mean motion: 13.16968092 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28820
Checksum: 324

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94209.91986747
Element set: 712
Inclination: 99.1754 deg
RA of node: 199.8594 deg
Eccentricity: 0.0012433
Arg of perigee: 19.9693 deg
Mean anomaly: 340.1957 deg
Mean motion: 14.13006241 rev/day
Decay rate: 8.3e-07 rev/day^2
Epoch rev: 30103
Checksum: 316

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94206.16702017
Element set: 307
Inclination: 82.5217 deg
RA of node: 113.6493 deg
Eccentricity: 0.0015211
Arg of perigee: 115.0034 deg
Mean anomaly: 245.2711 deg
Mean motion: 13.84369062 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 27294
Checksum: 276

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94206.27592288

Element set: 101
Inclination: 82.5580 deg
RA of node: 243.6642 deg
Eccentricity: 0.0008119
Arg of perigee: 186.1895 deg
Mean anomaly: 173.9139 deg
Mean motion: 13.04423668 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22786
Checksum: 308

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94205.89238965
Element set: 811
Inclination: 82.5441 deg
RA of node: 178.5177 deg
Eccentricity: 0.0017469
Arg of perigee: 44.5933 deg
Mean anomaly: 315.6629 deg
Mean motion: 13.84190069 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 20583
Checksum: 333

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94208.52814093
Element set: 25
Inclination: 98.8360 deg
RA of node: 227.3802 deg
Eccentricity: 0.0015002
Arg of perigee: 261.5803 deg
Mean anomaly: 98.3662 deg
Mean motion: 14.01353109 rev/day
Decay rate: -1.60e-06 rev/day^2
Epoch rev: 19935
Checksum: 287

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94206.20347469
Element set: 819
Inclination: 82.5270 deg
RA of node: 115.7430 deg
Eccentricity: 0.0012736
Arg of perigee: 308.5800 deg
Mean anomaly: 51.4224 deg
Mean motion: 13.83586125 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 19301

Checksum: 282

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94205.86668683
Element set: 718
Inclination: 82.5436 deg
RA of node: 142.9622 deg
Eccentricity: 0.0014163
Arg of perigee: 88.3601 deg
Mean anomaly: 271.9145 deg
Mean motion: 13.16463391 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15631
Checksum: 298

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94209.97738238
Element set: 116
Inclination: 98.6160 deg
RA of node: 236.8309 deg
Eccentricity: 0.0013628
Arg of perigee: 112.1636 deg
Mean anomaly: 248.0972 deg
Mean motion: 14.22433181 rev/day
Decay rate: 1.36e-06 rev/day^2
Epoch rev: 16644
Checksum: 299

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94208.09861331
Element set: 727
Inclination: 82.5543 deg
RA of node: 88.5658 deg
Eccentricity: 0.0014763
Arg of perigee: 93.3306 deg
Mean anomaly: 266.9508 deg
Mean motion: 13.16832663 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14171
Checksum: 315

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94207.86898054
Element set: 320
Inclination: 82.5482 deg
RA of node: 174.9895 deg
Eccentricity: 0.0023648

```
Arg of perigee: 111.9019 deg
Mean anomaly: 248.4661 deg
Mean motion: 13.83011161 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 4557
Checksum: 312

/EX
```

1181. orbs$210.misc.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 15:05:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-210.m.1994@ampr.org>
Source record: 27132
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-210.M
Orbital Elements 210.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX July 29, 1994
BID: $ORBS-210.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94206.20886141
Element set: 301
Inclination: 98.6465 deg
RA of node: 281.7033 deg
Eccentricity: 0.0011077
Arg of perigee: 84.7659 deg
Mean anomaly: 275.4787 deg
Mean motion: 14.28034406 rev/day
Decay rate: 1.2e-07 rev/day^2
Epoch rev: 4312
Checksum: 290

Satellite: MIR
Catalog number: 16609
Epoch time: 94208.19718392
Element set: 690
Inclination: 51.6474 deg
RA of node: 346.2470 deg
Eccentricity: 0.0001596
Arg of perigee: 176.9266 deg
Mean anomaly: 183.1737 deg
Mean motion: 15.56672881 rev/day
Decay rate: 1.859e-05 rev/day^2
Epoch rev: 48225
Checksum: 342

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94208.52592579
Element set: 511
Inclination: 28.4706 deg
RA of node: 336.8557 deg
Eccentricity: 0.0006320
Arg of perigee: 147.8719 deg
```

Mean anomaly: 212.2252 deg
Mean motion: 14.90646736 rev/day
Decay rate: 3.63e-06 rev/day^2
Epoch rev: 3541
Checksum: 297

Satellite: GRO
Catalog number: 21225
Epoch time: 94208.03852033
Element set: 120
Inclination: 28.4634 deg
RA of node: 315.4524 deg
Eccentricity: 0.0003172
Arg of perigee: 303.2211 deg
Mean anomaly: 56.8019 deg
Mean motion: 15.41089825 rev/day
Decay rate: 1.628e-05 rev/day^2
Epoch rev: 6309
Checksum: 253

Satellite: UARS
Catalog number: 21701
Epoch time: 94208.52684492
Element set: 560
Inclination: 56.9859 deg
RA of node: 357.4100 deg
Eccentricity: 0.0005682
Arg of perigee: 108.4118 deg
Mean anomaly: 251.7532 deg
Mean motion: 14.96553003 rev/day
Decay rate: 2.576e-05 rev/day^2
Epoch rev: 15697
Checksum: 308

/EX

1182. orbs$210.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 15:07:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-210.n.1994@ampr.org>
Source record: 27136
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-210.N
2Line Orbital Elements 210.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX July 29, 1994
BID: $ORBS-210.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 83355
UO-11
1 14781U 84021B 94206.57201705 .00000126 00000-0 29120-4 0 7113
2 14781 97.7853 219.4981 0012287 142.1150 218.0921 14.69232874555947
RS-10/11
1 18129U 87054A 94205.76394677 .00000021 00000-0 61233-5 0 9290
2 18129 82.9269 301.0678 0010302 284.6472 75.3539 13.72339428355066
AO-13
1 19216U 88051B 94205.91938835 .00000274 00000-0 10000-4 0 9355
2 19216 57.7565 240.1864 7222231 346.4624 1.6687 2.09718427 46805
FO-20
1 20480U 90013C 94206.26040988 -.00000051 00000-0 -35431-4 0 7081
2 20480 99.0420 350.8957 0539824 253.2264 100.8961 12.83226193209016
AO-21
1 21087U 91006A 94208.21479316 .00000093 00000-0 82657-4 0 4933
2 21087 82.9441 113.0988 0035418 335.1148 24.8298 13.74542430175081
RS-12/13
1 21089U 91007A 94205.88513475 .00000042 00000-0 28212-4 0 7115
2 21089 82.9215 343.4852 0030108 6.5069 353.6469 13.74044138173828
ARSENE
1 22654U 93031B 94205.08601395 -.00000142 00000-0 00000+0 0 2672
2 22654 1.9520 97.7392 2917162 186.8922 167.2050 1.42201946 1729
UO-14
1 20437U 90005B 94206.22284695 -.00000006 00000-0 14630-4 0 131
2 20437 98.5894 290.4825 0012008 78.9012 281.3516 14.29850235235026
AO-16
1 20439U 90005D 94206.20702088 .00000003 00000-0 18130-4 0 8113
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2 20439 98.5977 291.7399 0012239 79.4923 280.7641 14.29904338235030
DO-17
1 20440U 90005E 94206.22761656 -.00000004 00000-0 15240-4 0 8125
2 20440 98.5991 292.0970 0012389 78.8466 281.4111 14.30043974235052
WO-18
1 20441U 90005F 94205.78381851 -.00000004 00000-0 15267-4 0 8142
2 20441 98.5990 291.6570 0012956 80.7533 279.5114 14.30018047234996
LO-19
1 20442U 90005G 94206.24921416 .00000001 00000-0 17383-4 0 8105
2 20442 98.5996 292.3827 0013298 79.1581 281.1094 14.30114763235079
UO-22
1 21575U 91050B 94205.73789110 .00000018 00000-0 20773-4 0 5157
2 21575 98.4330 279.4738 0007454 171.9232 188.2073 14.36924859158479
KO-23
1 22077U 92052B 94206.41547975 -.00000037 00000-0 10000-3 0 4102
2 22077 66.0810 199.9404 0015234 277.3412 82.5876 12.86286814 91707
AO-27
1 22825U 93061C 94206.22287297 -.00000014 00000-0 12265-4 0 3088
2 22825 98.6518 281.6465 0009366 94.4271 265.7975 14.27629859 43114
IO-26
1 22826U 93061D 94206.20110340 -.00000005 00000-0 15806-4 0 3085
2 22826 98.6520 281.6684 0010136 97.7120 262.5225 14.27734369 43113
KO-25
1 22830U 93061H 94206.20302620 -.00000021 00000-0 88397-5 0 3134
2 22830 98.5527 278.5145 0012526 66.4100 293.8394 14.28060612 43126
NOAA-9
1 15427U 84123A 94209.86049340 .00000050 00000-0 50570-4 0 8945
2 15427 99.0483 260.8324 0015771 100.2990 259.9957 14.13631184496143
NOAA-10
1 16969U 86073A 94209.93863882 .00000033 00000-0 32404-4 0 7908
2 16969 98.5068 217.6655 0012694 204.4999 155.5579 14.24899864408442
MET-2/17
1 18820U 88005A 94208.55852336 .00000041 00000-0 23129-4 0 3495
2 18820 82.5407 236.4684 0018481 68.3344 291.9792 13.84719050327942
MET-3/2
1 19336U 88064A 94205.76914298 .00000051 00000-0 10000-3 0 3066
2 19336 82.5410 297.0872 0016655 164.4493 195.7144 13.16968092288209
NOAA-11
1 19531U 88089A 94209.91986747 .00000083 00000-0 69681-4 0 7125
2 19531 99.1754 199.8594 0012433 19.9693 340.1957 14.13006241301039
MET-2/18
1 19851U 89018A 94206.16702017 .00000056 00000-0 36844-4 0 3078
2 19851 82.5217 113.6493 0015211 115.0034 245.2711 13.84369062272940
MET-3/3
1 20305U 89086A 94206.27592288 .00000044 00000-0 10000-3 0 1012
2 20305 82.5580 243.6642 0008119 186.1895 173.9139 13.04423668227869
MET-2/19
1 20670U 90057A 94205.89238965 .00000027 00000-0 11152-4 0 8112
2 20670 82.5441 178.5177 0017469 44.5933 315.6629 13.84190069205833
FY-1/2
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1 20788U 90081A 94208.52814093 -.00000160 00000-0 -77915-4 0 250
2 20788 98.8360 227.3802 0015002 261.5803 98.3662 14.01353109199356
MET-2/20
1 20826U 90086A 94206.20347469 .00000058 00000-0 38953-4 0 8193
2 20826 82.5270 115.7430 0012736 308.5800 51.4224 13.83586125193012
MET-3/4
1 21232U 91030A 94205.86668683 .00000051 00000-0 10000-3 0 7183
2 21232 82.5436 142.9622 0014163 88.3601 271.9145 13.16463391156319
NOAA-12
1 21263U 91032A 94209.97738238 .00000136 00000-0 80415-4 0 1163
2 21263 98.6160 236.8309 0013628 112.1636 248.0972 14.22433181166449
MET-3/5
1 21655U 91056A 94208.09861331 .00000051 00000-0 10000-3 0 7273
2 21655 82.5543 88.5658 0014763 93.3306 266.9508 13.16832663141712
MET-2/21
1 22782U 93055A 94207.86898054 .00000051 00000-0 33013-4 0 3201
2 22782 82.5482 174.9895 0023648 111.9019 248.4661 13.83011161 45577
POSAT
1 22829U 93061G 94206.20886141 .00000012 00000-0 22305-4 0 3019
2 22829 98.6465 281.7033 0011077 84.7659 275.4787 14.28034406 43124
MIR
1 16609U 86017A 94208.19718392 .00001859 00000-0 32354-4 0 6909
2 16609 51.6474 346.2470 0001596 176.9266 183.1737 15.56672881482255
HUBBLE
1 20580U 90037B 94208.52592579 .00000363 00000-0 20944-4 0 5116
2 20580 28.4706 336.8557 0006320 147.8719 212.2252 14.90646736 35414
GRO
1 21225U 91027B 94208.03852033 .00001628 00000-0 32144-4 0 1209
2 21225 28.4634 315.4524 0003172 303.2211 56.8019 15.41089825 63090
UARS
1 21701U 91063B 94208.52684492 .00002576 00000-0 24557-3 0 5603
2 21701 56.9859 357.4100 0005682 108.4118 251.7532 14.96553003156978
/EX
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1183. * SpaceNews 01-Aug-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-07-29 20:23:37 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0801.1994@ampr.org>
Source record: 27138
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0801
* SpaceNews 01-Aug-94 *

BID: $SPC0801

=========
SpaceNews
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MONDAY AUGUST 1, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* AUGUST SPACE CALENDAR *
========================
Aug ?? - FAST (Fast Auroral Snapshot) Pegasus Launch
Aug ?? - ETS-VI (Engineering Test Satellite) H2 Launch (Japan)
Aug 05 - 25th Anniversary (1969), Mariner 7, Mars Flyby
Aug 06 - Comet Machholz Returns
Aug 12 - Perseids Meteor Shower (Potential Meteor Storm)
Aug 18 - STS-68, Endeavour, Shuttle Radar Laboratory (SRL-2)
Aug 25 - 5th Anniversary (1989), Voyager 2, Neptune Flyby
Aug 28 - 205th Anniversary (1789), William Herschel's Discovery of Enceladus (Saturn Moon)
Aug 31 - DSPSE (Clementine), Asteroid 1620 Geographus Flyby

[Info via Ron Baalke]

* VE3ONT EME CONTEST SKED *
===========================
The Toronto VHF Society, VE3ONT, will participate in this year's ARRL EME Contest using the Institute for Space and Terrestrial Science's 46m (150') Algonquin Park dish (located at grid square FN05xw). This year's operation will provide an increased opportunity to work 144 MHz stations.

UTC Date VE3ONT TX Freq Listening Range Approx. Times

29-Oct-94 432.050 MHz 432.050 - 432.060 MHz 0645 - 1815 UTC
30-Oct-94 1296.050 MHz 1296.050 - 1296.060 MHz 0754 - 1844 UTC
26-Nov-94 144.100 MHz 144.100 - 144.110 MHz 0538 - 1645 UTC
27-Nov-94 144.100 MHz 144.100 - 144.110 MHz 0646 - 1713 UTC

Because the Algonquin dish has a 9 degree lower elevation limit, stations with horizon fixed antennas in eastern North America will have a limited chance to work VE3ONT. The following operating hints will improve your

chance of making a QSO:

- As in 1993, VE3ONT will work "split" frequency. Do not call on VE3ONT's TX frequency. Pick a random frequency in the listening range. Use the full range. VE3ONT will be looking for stations in the clear.

- VE3ONT will use circular polarization on all bands. You may use linear or circular polarization to make a contact with VE3ONT. If circular, use RHCP on TX and RX for the 144 and 432 MHz bands. On 1296 MHz, they will have switchable sense so you may use either the satellite or EME polarization convention.

- Conditions permitting, VE3ONT may start each operating period on SSB to work strong stations as quickly as possible. Please do not call again for a second contact on CW. Conversely, if you make a contact on CW, please do not call again for a SSB QSO.

- All contacts will be "random" with no schedules or sequencing. Please be patient. VE3ONT experienced a great deal of QRM during last year's event.

Low power and OSCAR class stations are encouraged to make an EME contact with VE3ONT. 100 watts delivered to a single long yagi should be sufficient on the 144 and 432 MHz bands. On 1296 MHz, stations were worked with as little as 10 watts and a 2m (6') dish in 1993.

Be advised that use of the dish at the Algonquin Space Complex is always subject to last minute preemption for non-Amateur purposes.

QSLs with an SAE should be directed to Dennis Mungham VE3ASO, RR 3, Mountain, Ontario, Canada, K0E1S0. Reception reports are also welcome. Send your log to the ARRL.

For further information, contact Peter Shilton VE3VD, (905) 774-8766. The latest developments will be provided at the Central States VHF Conference July 29-30, Memphis, TN, and the International EME Conference, Gottskars, Sweden, August 26-28.

[Info via Michael Owen, W9IP]

* NEW SPACE ORGANIZATION *
==========
A group of space science educators involved in the use of classroom and school space simulators (including permanent, semi-permanent, and temporary simulators) met at University School in Shaker Heights, Ohio (a suburb of Cleveland) during July of 1994 for the purpose of establishing a national organization.

The purposes of the organization are:

1. To facilitate the exchange of ideas, information, and technical enhancements among simulator using educators.

2. To assist teachers interested in developing space simulators.

3. To provide consultation services to teachers and schools
regarding the use of space simulators in space science education.

4. To encourage the use of the information superhighway as a tool
for enhancing space science simulations.

5. To provide assistance regarding sources of free or low cost
resources and materials from the aerospace community, government
organizations, and information providers.

6. To advance the use of simulation as an educational technique in
all areas of education.

Membership in The National Association of Space Simulating
Educators is open to anyone interested in education. The
organization's focus is school educators at all levels from pre-K
through college.

For a free informational pamphlet, write The National Association
of Space Simulating Educators, attn. Robert E. Morgan, University
School, 20701 Brantley Rd., Shaker Heights, Ohio 44122 or send
electronic mail requesting the pamphlet to: nasse@shadowso.com.

[Info via Robert E. Morgan, K8RBV]

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

N2RPZ VE4KHS WB4APR F6HLG KC6ROL

* FEEDBACK/INPUT WELCOMED *
==========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA

Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1184. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-07-30 03:33:24 UTC
From: tkelso@afit.af.mil
Message-ID: <rec-radio-info_775673581@unomaha.edu>
Source record: 27137
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.info on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (also updated daily) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a eleven-character name.

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1185. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-07-31 03:00:08 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_775623607@ve6mgs.ampr.org>
Source record: 27144
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

```
Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
```

a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

< Dated information here >

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat

transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

--
Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

1186. ANS-210 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-07-31 03:44:25 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-211.01.1994@ampr.org>
Source record: 27135
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-211.01
AMSAT-UK PHONE NUMBER CHANGE

HR AMSAT NEWS SERVICE BULLETIN 211.01 FROM AMSAT HQ
SILVER SPRING, MD JULY 30, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-211.01

AMSAT-UK Land-Line Phone Numer Changes For Non-UK Callers

Some of you will be aware that as from 1995 April 16, all UK telephone area codes will change. With five exceptions listed below, all will simply acquire a leading digit "1".

Thus for example, when calling Amsat-UK from overseas, after 95-APR-16, you will ring +44 181 989 6741.
^
+---- Additional "1"

Key: "+" is your code for International access, "44" is UK, and "181" is the new code. (The present code is "81").

>From 94-AUG-01 until 95-APR-16 both new and old codes will work to allow these changes to be phased in.

They are designed to ensure that Britain has enough dialling codes to last well into the next century.

Remember, the old area codes will cease to work after 95-APR-16; the new ones are already activated.

So start changing your memory phones and databases now!

And of course, beware the overlap problem that will plague us for a couple of years while old numbers persist in written material, and the new numbers appear early. You should be able to tell the difference, as NONE of the present day "old" UK codes commences with a one.

The five exceptions mentioned, which will have completely new area codes, are:

City Old Code New Code

Leeds 532 1132
Sheffield 742 1142
Nottingham 602 1159
Leicester 533 1162

Bristol 272 1179

[The AMSAT News Serive (ANS) wishes to thank James Miller (G3RUH) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-211.02
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 211.02 FROM AMSAT HQ
SILVER SPRING, MD JULY 30, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-211.02

Weekly OSCAR Status Reports: 30-JUL-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
[G3RUH/DB2OS/VK5AGR]

DO-17: DO-17 still continues to transmit its voice message on a downlink frequency of 145.825 MHz.

RS-10: WC9C reports that RS-10 has been performing well. Although the CW Robot was off for about a week, it is now back on. Since WC9C got back on around Field Day after being off for a few months he has noticed a change in the satellite's 10 meter antenna pattern. Now it is about 6-10 dB weaker as it approaches and is stronger as it passes by. This was just the opposite just a few months ago. Does anyone know if the "parent" spacecraft orientation has changed? Last week the Special Event Station WA3NAN was on 29.391 MHz and heard lots of station trying to working them. [WC9C]

AO-10: KC6EIJ reports that AO-10 is putting down excellent signals but now suffers from NO OPERATORS! He suggests that before you start you satellite operations each day, take a "listen" to AO-10 and find out how it is doing. DON'T WRITE OFF AO-10 YET BECAUSE IT STILL HAS A LOT OF LIFE LEFT! [KC6EIJ]

UO-22: Operating normally. [K6OYY],

KO-23: Operating normally. [K6OYY]

KO-25: Operating normally with lots of activity. Numerous stations have noted the element sets for KO-25 are not accurate, but are usable. A similar problem happened on a previous OSCAR satellite launch, in that case the launch vehicle, or parts thereof were being tracked, instead of the satellite of interest. [K6OYY]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1187. Two-Line Orbital Element Sets (TLE440)

Newsgroup: rec.radio.amateur.space
Date: 1994-07-31 14:27:19 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.775664839@afit.af.mil>
Source record: 27140

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #440 -
Alouette 1
1 00424U 62049 94206.16416817 .00000035 00000-0 31235-4 0 139
2 00424 80.4635 247.5321 0023726 20.5347 339.6742 13.67815203587597
ATS 1
1 02608U 66110A 94206.31391271 -.00000321 00000-0 10000-3 0 8909
2 02608 14.5744 0.0371 0010265 47.1811 310.8036 1.00364096 17840
ATS 3
1 03029U 67111A 94207.26640390 -.00000127 00000-0 10000-3 0 2226
2 03029 14.6787 7.0759 0009267 265.9761 21.3700 1.00273214 97826
Cosmos 398
1 04966U 71016A 94209.98702599 .00094209 75801-5 17824-3 0 3981
2 04966 51.4407 164.6138 0989588 128.9359 240.5198 13.97095129778570
Starlette
1 07646U 75010A 94206.61595916 -.00000144 00000-0 71193-6 0 8007
2 07646 49.8255 1.7072 0205911 103.1532 259.2424 13.82186403983169
LAGEOS
1 08820U 76039A 94206.00054399 -.00000006 00000-0 10000-3 0 143
2 08820 109.8207 148.5484 0044351 277.1894 82.3624 6.38664317169562
ETS-2
1 09852U 77014A 94155.72139470 -.00000030 00000-0 10000-3 0 9695
2 09852 12.1309 41.6509 0005050 31.5788 84.1882 1.00019547 10200
GOES 2
1 10061U 77048A 94206.13281640 .00000058 00000-0 00000+0 0 3749
2 10061 11.2698 45.2504 0001606 9.9831 159.1220 1.00280998 7497
IUE
1 10637U 78012A 94202.44587725 -.00000304 00000-0 10000-3 0 201
2 10637 34.6500 94.3226 1316945 36.9889 277.9075 1.00257039 13069
GPS BI-01
1 10684U 78020A 94205.59628876 -.00000040 00000-0 10000-3 0 2843
2 10684 64.6438 44.4003 0061758 163.8255 196.3650 1.98069076105679
```

```
GPS BI-02
1 10893U 78047A 94204.45890739 -.00000022 00000-0 10000-3 0 856
2 10893 63.5267 283.2651 0215175 13.8165 346.8118 2.01627369118809
GOES 3
1 10953U 78062A 94203.75955086 .00000037 00000-0 10000-3 0 3374
2 10953 10.2001 48.0668 0005944 67.3780 281.9279 1.00252683 12074
SeaSat 1
1 10967U 78064A 94206.17212704 -.00000004 00000-0 43287-4 0 3091
2 10967 108.0020 180.8192 0002503 246.0274 114.0602 14.37968752841829
GPS BI-03
1 11054U 78093A 94208.55615025 -.00000042 00000-0 10000-3 0 2039
2 11054 63.2269 280.5548 0044766 178.2581 181.8396 1.93505436115292
Nimbus 7
1 11080U 78098A 94206.20065303 -.00000074 00000-0 -28996-4 0 4134
2 11080 99.0486 88.4030 0009778 33.0430 327.1334 13.83728874795336
GPS BI-04
1 11141U 78112A 94206.72424486 -.00000047 00000-0 00000+0 0 9008
2 11141 64.6438 45.6574 0048759 26.6362 333.6854 1.92894367 4522
GPS BI-05
1 11690U 80011A 94207.80072515 -.00000047 00000-0 10000-3 0 8127
2 11690 65.0550 46.0980 0143036 197.7177 161.7807 2.00557674120338
GPS BI-06
1 11783U 80032A 94202.40140384 -.00000008 00000-0 10000-3 0 9896
2 11783 62.6353 277.0763 0210543 29.2556 331.9944 2.03456665104659
GOES 5
1 12472U 81049A 94201.84062326 -.00000005 00000-0 10000-3 0 7780
2 12472 6.8935 57.6401 0006855 19.2043 39.9441 1.00329637 6103
Cosmos 1383
1 13301U 82066A 94206.20864409 .00000008 00000-0 -82941-5 0 3110
2 13301 82.9309 281.8782 0027784 353.4293 6.6492 13.68056630602625
LandSat 4
1 13367U 82072A 94208.16458154 .00000031 00000-0 17009-4 0 5133
2 13367 98.1742 265.9783 0007631 123.8946 236.2980 14.57122204639885
IRAS
1 13777U 83004A 94210.03351185 .00000354 00000-0 27422-3 0 6643
2 13777 98.9701 40.1119 0012022 194.3513 165.7310 13.99210764256996
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2 22058 64.9348 347.6314 0008453 271.9655 87.9394 2.13102757 15437
TOPEX
1 22076U 92052A 94205.20358646 -.00000038 00000-0 10000-3 0 7847
2 22076 66.0405 214.1147 0007537 263.2850 96.7308 12.80930758 91239
KO-23
1 22077U 92052B 94206.41547975 -.00000037 00000-0 10000-3 0 4102
2 22077 66.0810 199.9404 0015234 277.3412 82.5876 12.86286814 91707
S80/T
```

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1 22078U 92052C 94206.41504290 -.00000037 00000-0 10000-3 0 4072
2 22078 66.0805 199.1839 0016721 277.0406 82.8712 12.86569243 91777
GPS BIIA-15
1 22108U 92058A 94204.37756653 .00000004 00000-0 10000-3 0 4294
2 22108 54.3290 255.9911 0107633 141.1563 219.7069 2.00556133 13655
FREJA
1 22161U 92064A 94206.42675390 .00000007 00000-0 51140-4 0 4234
2 22161 62.9976 195.9372 0786367 318.4763 35.8983 13.21768330 86855
LAGEOS II
1 22195U 92070B 94205.66979372 -.00000009 00000-0 10000-3 0 3130
2 22195 52.6557 69.9862 0138557 133.5302 227.6862 6.47293694 41375
GPS BIIA-16
1 22231U 92079A 94209.55139000 .00000056 00000-0 00000+0 0 4247
2 22231 54.7075 197.2964 0038496 294.5527 65.0394 2.00555557 12332
GPS BIIA-17
1 22275U 92089A 94207.19797197 .00000030 00000-0 00000+0 0 4366
2 22275 54.6449 194.9495 0054450 252.1498 107.2490 2.00564904 11692
TDRS 5
1 22314U 93003B 94209.16660301 -.00000289 00000-0 10000-3 0 4207
2 22314 1.1924 73.0019 0001907 29.2309 217.1866 1.00261535 5664
GPS BIIA-18
1 22446U 93007A 94209.26230227 -.00000093 00000-0 00000+0 0 4251
2 22446 54.6337 315.6294 0072570 344.4297 15.2992 2.00567783 10728
Glonass 59
1 22512U 93010A 94205.19850818 -.00000005 00000-0 00000+0 0 6065
2 22512 64.9208 107.6966 0008550 198.8888 161.1264 2.13101767 10905
Glonass 60
1 22513U 93010B 94209.83120299 -.00000026 00000-0 00000+0 0 6203
2 22513 64.9098 107.5530 0006811 195.9917 164.0419 2.13102374 11199
Glonass 61
1 22514U 93010C 94209.12898875 -.00000021 00000-0 00000+0 0 6045
2 22514 64.9295 107.5667 0013201 192.1228 167.8989 2.13101545 11186
ASTRO-D
1 22521U 93011A 94206.12864317 .00000434 00000-0 30818-4 0 3112
2 22521 31.1064 197.6347 0076181 103.4929 257.4206 14.93279650 77777
UFO F1
1 22563U 93015A 94204.58506642 -.00000287 00000-0 10000-3 0 3100
2 22563 26.5838 299.2444 0003456 226.5011 118.5026 0.99252460 9190
GPS BIIA-19
1 22581U 93017A 94204.41773970 -.00000086 00000-0 10000-3 0 3213
2 22581 55.1272 16.1113 0047364 30.5620 329.7131 2.00564432 9680
ARSENE
1 22654U 93031B 94205.08601395 -.00000142 00000-0 00000+0 0 2672
2 22654 1.9520 97.7392 2917162 186.8922 167.2050 1.42201946 1729
GPS BIIA-20
1 22657U 93032A 94207.54863458 -.00000089 00000-0 00000+0 0 3344
2 22657 55.1688 15.8030 0064896 205.2676 154.4197 2.00554490 5077
RADCAL
1 22698U 93041A 94205.79133989 .00000038 00000-0 10514-4 0 3162
2 22698 89.5491 307.4716 0093853 64.9204 296.1688 14.21315901 55935
```

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GPS BIIA-21
1 22700U 93042A 94207.01336096 -.00000015 00000-0 00000+0 0 3146
2 22700 54.4991 256.5966 0029316 321.0109 38.8836 2.00555393 7860
NOAA 13
1 22739U 93050A 94209.84433990 -.00000060 00000-0 -84867-5 0 5143
2 22739 98.9493 154.0743 0010765 7.8767 352.2569 14.10902086 49843
GPS BIIA-22
1 22779U 93054A 94205.60230917 -.00000089 00000-0 10000-3 0 3510
2 22779 54.7822 315.7197 0022994 230.8546 128.9633 2.00576315 6595
Meteor 2-21
1 22782U 93055A 94207.86898054 .00000051 00000-0 33013-4 0 3201
2 22782 82.5482 174.9895 0023648 111.9019 248.4661 13.83011161 45577
UFO F2
1 22787U 93056A 94204.61995789 -.00000076 00000-0 00000+0 0 2976
2 22787 4.8034 323.5736 0008948 151.0190 120.9869 1.00274057 3455
SPOT 3
1 22823U 93061A 94206.27069939 .00000046 00000-0 42103-4 0 3305
2 22823 98.7124 280.1772 0001929 78.7583 281.3814 14.20034267 42895
STELLA
1 22824U 93061B 94206.19111744 -.00000030 00000-0 55812-5 0 3080
2 22824 98.6507 281.4828 0007295 95.0438 265.1591 14.27097522 43094
AO-27
1 22825U 93061C 94206.22287297 -.00000014 00000-0 12265-4 0 3088
2 22825 98.6518 281.6465 0009366 94.4271 265.7975 14.27629859 43114
IO-26
1 22826U 93061D 94206.20110340 -.00000005 00000-0 15806-4 0 3085
2 22826 98.6520 281.6684 0010136 97.7120 262.5225 14.27734369 43113
HEATHSAT
1 22827U 93061E 94206.24884180 .00000003 00000-0 18984-4 0 3706
2 22827 98.6497 281.6810 0010087 85.0396 275.1934 14.27846109 43122
PO-28
1 22829U 93061G 94206.20886141 .00000012 00000-0 22305-4 0 3019
2 22829 98.6465 281.7033 0011077 84.7659 275.4787 14.28034406 43124
KO-25
1 22830U 93061H 94206.20302620 -.00000021 00000-0 88397-5 0 3134
2 22830 98.5527 278.5145 0012526 66.4100 293.8394 14.28060612 43126
GPS BIIA-23
1 22877U 93068A 94207.15127106 -.00000046 00000-0 10000-3 0 1477
2 22877 55.2234 76.8725 0032988 287.0566 72.6524 2.00572370 5511
METEOSAT 6
1 22912U 93073B 94205.95462108 -.00000096 00000-0 00000+0 0 1114
2 22912 0.8166 267.1095 0002105 245.0872 124.5443 1.00275360 901
HST Array
1 22920U 90037C 94208.06298238 .00003048 00000-0 24384-3 0 1749
2 22920 28.4772 327.8722 0004565 328.3468 31.6793 14.97208083 35472
Meteor 3-6
1 22969U 94003A 94206.53458027 .00000051 00000-0 10000-3 0 822
2 22969 82.5573 29.1968 0015047 165.1080 195.0489 13.16723971 23891
TUBSAT-B
1 22970U 94003B 94206.52065542 .00000051 00000-0 10000-3 0 728
```

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2 22970 82.5573 29.1846 0015765 162.6904 197.4747 13.16822837 23896
ODERACS A
1 22990U 94006B 94209.79574975 .00075196 12750-4 18574-3 0 1388
2 22990 56.9804 133.7745 0004894 236.3531 123.7007 15.96159480 26808
ODERACS B
1 22991U 94006C 94210.15752722 .00076606 12807-4 19450-3 0 1305
2 22991 56.9810 132.6098 0002709 248.0122 112.0700 15.95654127 26857
ODERACS E
1 22994U 94006F 94210.18341086 .00020299 00000-0 95550-4 0 1028
2 22994 56.9804 138.8708 0007325 244.0444 115.9927 15.83180938 26765
ODERACS F
1 22995U 94006G 94207.02207488 .00019003 00000-0 89451-4 0 1322
2 22995 56.9822 153.2728 0006940 230.2051 129.8397 15.83236104 26269
BREMSAT
1 22998U 94006H 94205.98263487 .00020394 00000-0 99047-4 0 1124
2 22998 56.9906 159.1212 0003822 221.6392 138.4385 15.82528056 25931
GPS BIIA-24
1 23027U 94016A 94208.22885734 -.00000087 00000-0 00000+0 0 734
2 23027 54.9653 17.8773 0062455 191.5200 168.3676 2.00561292 2849
Glonass 62
1 23043U 94021A 94210.20271521 -.00000066 00000-0 00000+0 0 739
2 23043 64.8090 347.9145 0006727 177.7410 182.2678 2.13102862 2329
Glonass 63
1 23044U 94021B 94207.73929425 -.00000073 00000-0 00000+0 0 533
2 23044 64.8043 347.9980 0029309 201.0469 158.8327 2.13103024 2276
Glonass 64?
1 23045U 94021C 94209.31341175 -.00000068 00000-0 00000+0 0 646
2 23045 64.7782 347.9656 0002024 339.0013 21.0021 2.12797216 2305
GOES 8
1 23051U 94022A 94209.43791567 -.00000191 00000-0 00000+0 0 1414
2 23051 0.3640 264.8906 0001974 279.4896 188.9835 1.00277530 712
STRV-1A
1 23125U 94034B 94206.23670815 .00000003 00000-0 14714-3 0 226
2 23125 6.9849 170.0750 7277101 208.7128 76.0351 2.27310186 871
STRV-1B
1 23126U 94034C 94204.98615661 .00000072 00000-0 15639-3 0 206
2 23126 6.9962 170.8027 7281209 207.4731 79.3962 2.26906100 840
1994032D
1 23134U 94032D 94206.08664352 .23036644 -87566-6 10317-2 0 628
2 23134 82.5628 340.2992 0025850 331.4241 46.1088 16.40063932 7629
1994032H
1 23138U 94032H 94210.23670426 .00166804 -11561-5 17180-3 0 661
2 23138 82.5835 334.8060 0045924 293.7927 65.8559 16.08270122 8327
Soyuz TM-19
1 23139U 94036A 94209.86628593 .00004453 00000-0 67959-4 0 392
2 23139 51.6478 337.8952 0002020 178.6366 181.4371 15.56691294 4286
1994033D
1 23142U 94033D 94210.15108608 .00622105 15516-3 18829-2 0 523
2 23142 62.7979 283.6866 0064299 13.7510 346.5451 15.88251931 7042
1994033E
```

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1 23143U 94033E 94206.32598269 .00094549 82016-5 10000-3 0 355
2 23143 62.8150 294.6379 0068123 107.6725 253.1917 16.05278733 6506
FSW 2
1 23145U 94037A 94209.76445568 .00120744 79634-5 14330-3 0 624
2 23145 62.9547 248.8635 0113140 153.8455 206.8427 15.96599479 4071
Cosmos 2282
1 23168U 94038A 94208.13093059 -.00000197 00000-0 00000+0 0 322
2 23168 2.2747 291.9910 0006851 305.4142 89.9253 1.00281407 250
1994038D
1 23171U 94038D 94205.38167119 -.00000265 00000-0 10000-3 0 94
2 23171 2.3114 292.1254 0019992 6.3142 89.5543 0.99430715 178
1994038E
1 23172U 94038E 94206.03932474 .00001168 00000-0 78417-3 0 135
2 23172 47.8302 287.4196 7285494 4.5025 359.5731 2.25486477 9347
1994038F
1 23174U 94038F 94189.63147236 .03238761 00000-0 59326+1 0 35
2 23174 47.9544 291.8792 7263552 0.3524 359.9234 2.24222805 8981
PANAMSAT 2
1 23175U 94040A 94209.52193637 .00000113 00000-0 10000-4 0 312
2 23175 0.0335 332.5283 0035484 121.0023 235.4971 1.00278616 237
BS-3N
1 23176U 94040B 94209.34549075 -.00000365 00000-0 00000+0 0 217
2 23176 0.1878 297.1766 0008401 83.0253 171.9428 1.00416899 41
1994040C
1 23177U 94040C 94207.82231309 .00000041 00000-0 38688-3 0 124
2 23177 7.5607 81.0513 7294491 193.6002 123.3591 2.20412536 371
SPELDA
1 23178U 94040D 94203.72032864 .00036041 00000-0 57874-2 0 154
2 23178 7.0069 83.7040 7285829 189.2050 140.6724 2.28830388 290
NADEZHDA 4
1 23179U 94041A 94206.47762298 .00000026 00000-0 11847-4 0 80
2 23179 82.9460 29.9955 0034968 259.0264 100.6959 13.75656425 1555
1994041B
1 23180U 94041B 94209.87980637 -.00001465 00000-0 -14939-2 0 159
2 23180 82.9388 27.4450 0026032 241.9274 117.9253 13.77165435 2022
1994042A
1 23182U 94042A 94210.18472222 .00360513 57435-5 15061-3 0 241
2 23182 67.1053 159.8413 0130098 84.8967 277.9283 16.05685673 1369
1994042B
1 23183U 94042B 94207.04250314 .14432072 64021-5 12726-3 0 260
2 23183 67.0950 170.0801 0018103 87.1997 41.1623 16.50550804 862
1994042C
1 23184U 94042C 94202.34492184 .10824003 58503-5 22539-2 0 54
2 23184 67.0746 186.3962 0082002 97.6891 277.6183 16.21548842 103
1994043A
1 23185U 94043A 94219.71495370 -.00000301 00000-0 00000+0 0 197
2 23185 0.0354 269.3469 0032490 23.0455 59.0739 1.00282219 197
1994043B
1 23186U 94043 B 94206.93289598 .00047659 00000-0 32039-2 0 120
2 23186 026.8378 092.3439 7617881 180.2100 178.8294 01.89943016000095
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1188. New

Newsgroup: rec.radio.amateur.space
Date: 1994-08-01 07:07:00 UTC
From: barry.davis@woodybbs.com
Message-ID: <93.817.7587.0NFB2CD3@woodybbs.com>
Source record: 27146

VBARNET BBS is now carrying this conference.

--- Squish v1.01
* Origin: VBARNET * USA * (410)761-3406 or 922-8947 * PCB & OS/2 (1:261/1458)

1189. APT-Satellites: Report JULY 31, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-08-01 07:09:32 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-010894071155@oskar.gmd.de>
Source record: 27141

```
Observed at station 50.7 NLat, 7.1 ELon, JULY 31, 1994

NOAA-9: APT 137.62 *OFF*
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 *OFF*
Meteor 3-5: APT 137.85 On

NOAA-9 is off due to VHF-conflict with NOAA-11. Checked
APT of Meteor 3-3, -4, and -6, no Signal 137.00-137.99 MHz
06.30 UT until 19.00 UT.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

1190. OSCAR Freqs?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-01 07:22:34 UTC
From: drice@crl.com
Message-ID: <31i7rq$9ls@crl.crl.com>
Source record: 27142
Body handling: HTML body converted to readable text

How do I found out what frequencies the OSCAR satelites use?

Dennis

--

Dennis Rice drice@crl.com
NAU Flagstaff, AZ drr1@nauvax.ucc.nau.edu
Call Sign:

1191. UNAMSAT-1

Newsgroup: rec.radio.amateur.space
Date: 1994-08-01 10:06:33 UTC
From: steyaert@innet.be
Message-ID: <steyaert.6.000B1BF9@innet.be>
Source record: 27143

Does anyone know the current status of UNAMSAT-1, carrying a meteor sounder ?

Has it already be launched ?

Thanks,

Chris Steyaert
VVS - astronomical association Belgium

1192. Re: OSCAR Freqs?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-01 17:12:25 UTC
From: ewp@world.std.com
Message-ID: <Ctv94p.ILE@world.std.com>
Source record: 27145
Body handling: HTML body converted to readable text

drice@crl.com (Dennis Rice Jr) writes:

>How do I found out what frequencies the OSCAR satelites use?

>Dennis

>--
>--
> Dennis Rice drice@crl.com
> NAU Flagstaff, AZ drr1@nauvax.ucc.nau.edu
> Call Sign: --

Anyone could post the frequencies of the digital satellites?

Thanks in advance.

Edson

ewp@world.std.com

--
-- Edson
ewp@world.std.com

1193. Sat freqs

Newsgroup: rec.radio.amateur.space
Date: 1994-08-02 14:42:38 UTC
From: Gary_Rogers@DGC.ceo.dg.COM
Message-ID: <9408021542.AD00037@rtp41.rtp.dg.com>
Source record: 27147

Message:
In Ham-Space Digest, V94 #212, Edson (ewp@world.std.com) writes:

>Anyone could post the frequencies of the digital satellites?

A really good FAQ can be downloaded by E-mail from the ARRL Server.
Send the following:

To: Info@ARRL.org
Subject: (nl)
Message: send faqsat.txt
quit

While you're at it, also ask for the Help and Index files. Just put
"quit" as the last command.

Hope this helps.

Gary, WA4YMZ Gary Rogers@DGC.ceo.dg.com "My opinions are my own!"

1194. RE: OSCAR Freqs?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-02 16:59:58 UTC
From: pchien@ids.net
Message-ID: <31mtls$jvu@paperboy.ids.net>
Source record: 27150
Body handling: HTML body converted to readable text

There's an excellent booklet "How to use the amateur radio
Satellites" - Third Edition. by Keith C. Baker KB1SF.

I believe it goes for about $10 or so. You can order it
directly from Amsat 850 Sligo Ave. Silver Spring MD 20910.
301-589-6062.

Philip Chien KC4YER
no sig yet

In Article <31i7rq$9ls@crl.crl.com>
drice@crl.com (Dennis Rice Jr) writes:
>How do I found out what frequencies the OSCAR satelites use?
>
>Dennis
>
>--
>---
> Dennis Rice drice@crl.com
> NAU Flagstaff, AZ drr1@nauvax.ucc.nau.edu
> Call Sign: --

1195. STS-65

Newsgroup: rec.radio.amateur.space
Date: 1994-08-02 20:35:00 UTC
From: st3qi@elroy.uh.edu
Message-ID: <2AUG199415355713@elroy.uh.edu>
Source record: 27148

I made it in the STS-65 packet "heard" list. I never saw my QSO# come
across my screen, but the Shuttle ovbiously tried to reply to my
connect request. Is this enough to qualify for a QSL card?

--
Brad A. Killebrew N5LJV, EMT-B | Student of Computer Engr Technology
President, University of Houston ARC | University of Houston, Texas
Internet: st3qi@jetson.uh.edu | U of H Amateur Radio Club WB5FND
AmprNet : n5ljv@sugarland.ampr.org | uharc@post-office.uh.edu
Packet : n5ljv@f6cnb.#setx.tx.usa.na | Box 85-T2, 4800 Calhoun, 77204-4083
AT&Tnet : 713-852-8523 Fax 852-2630 | For info, Finger st3qi@jetson.uh.edu

1196. RS-10

Newsgroup: rec.radio.amateur.space
Date: 1994-08-02 20:46:00 UTC
From: alan.lyday@aquila.com
Message-ID: <f.637.2582@aquila.com>
Source record: 27152

Hello ALL I wonder if anyone else has notice the change in RS-10 10 meter downlink? After reviewing my notes from observations taken about a year ago, The downlink seems to have switched. Now the signal is slightly weaker as it approaches, It was just the opposite before. All my oberservation where based on monitoring the Main CW Beacon. Anyone else Notice this? and Does anyone have a more detailed observations of the 10 meter downlink ? In the past the Russians used a full Dipole for the 10 mtr is it possible that this time its just a Monopole ? I cant seem to fine much if any information about there Cosmos Satellite which is the parent spacecraft for RS-10. Looking forward to any replys.. 73 GL de AL WC9C

* RM 1.3 00559 *

1197. Oscar 10 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-02 20:51:01 UTC
From: Wayne_Estes@csg.mot.com
Message-ID: <9408021550.ZM27670@SALCIUS2>
Source record: 27149

Question #1:

The Satellite Experimenter's Handbook says not to use Oscar 10 if the beason doesn't transmit a pure tone. On Sunday night the beacon sounded very distorted. As an experiment I tried sending a CQ in the passband and could hear myself on the downlink loud and clear. (nobody else was on the satellite)

Question #1:
Is it really true that I should avoid transmitting to Oscar 10 when the beacon does not transmit a pure tone?

Instant Track indicates that the Oscar 10 antennas are almost always severely off-pointed from earth (more than 90 degrees most of the time)

Question #2:
Are the Oscar 10 antennas omnidirectional enough to allow reliable contacts when the offpointing angle is large?

- Wayne Estes WD5FFH wayne@csg.mot.com

--
Wayne A. Estes
Motorola Asia-Pacific Cellular Subscriber Division
600 N. U.S. Hwy. 45, Rm. A-S345
Libertyville, IL 60048-1286
PHONE: 1-708-523-2386 Z-MAIL: wayne@csg.mot.com
FAX: 1-708-523-8795 POST: w10191@email.mot.com

1198. Sat Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-08-03 06:39:50 UTC
From: hansky@mb3.tu-chemnitz.de
Message-ID: <hansky.775895990@goya>
Source record: 27151

Hello everybody,

an improved version of our tracking program is available now by
anonymous ftp to:

igel.physik.th-zwickau.de

The filename refers to the date of compilation.

Karsten - DL3HRT.

Karsten Hansky (DL3HRT)
e-mail: hansky@igel.physik.th-zwickau.de
AX25 : DL3HRT@DB0LPZ.#SAX.DEU.EU
Phone : +49 0375 536 1429

1199. Beginning with PACSATs question

Newsgroup: rec.radio.amateur.space
Date: 1994-08-03 12:52:18 UTC
From: Iver@ksu.ksu.edu
Message-ID: <31o3u2$899@matt.ksu.ksu.edu>
Source record: 27153

Recently (maybe one to two months ago), someone posted
a beginners guide to 2m packet over satellites. I've
lost my copy, could someone repost it, or email me a copy?
Thanks

1200. Low-band Satellite transponders?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-03 17:33:26 UTC
From: brandtk@silver.ucs.indiana.edu
Message-ID: <CtyzFr.Hqy@usenet.ucs.indiana.edu>
Source record: 27154

I have heard there are two amateur satellites that work entirely on the low-bands (10 and 15 meters?). I would appreciate it if someone would let me know which satellites and what the passbands are. If there is an archive somewhere with this info, a pointer would be appreciated.

Thanks,
Keith

==
Keith E. Brandt, MD, WD9GET || Goodbye, cruel world that was my home-
New Castle Family Physicians || there's cleaner space out here to roam.
New Castle, Indiana || Put my feet up on the moons of Mars-
brandtk@silver.ucs.indiana.edu || sit back, relax, and count the stars.
==

1201. Need list of modes and uplink/downlink frequencies

Newsgroup: rec.radio.amateur.space
Date: 1994-08-04 14:56:29 UTC
From: reisert@sttng.mlo.dec.com
Message-ID: <1994Aug4.145629.1688@peavax.mlo.dec.com>
Source record: 27155

I would like a list of satellite modes and their uplink/downlink
frequencies, preferably going back to the start of time (OSCAR-6)?

Anyone have such a list?

Thanks - Jim AD1C

--
Jim Reisert AD1C Internet: reisert@mlo.dec.com
Digital Equipment Corp. UUCP: ...decwrl!mlo.dec.com!reisert
146 Main Street - MLO5-2/M16 Voice: 508-493-5747
Maynard, MA 01754 FAX: 508-493-0700

1202. GPS Freq and antenna questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-04 18:50:22 UTC
From: gdelong@ctron.com
Message-ID: <31rd9eINN137@dur-news.ctron.com>
Source record: 27156

I broke down and bought a hand held GPS unit (GARMIN GPS-45)
and am interested is setting it up for land mobile in the
car.

The manufacturer sells an external, temp mount antenna for
more than a few dollars, so I plan to try to throw something
together.

The questions: What freq range(s) do the GPS transmiters use?
and, is there anything "special" in the antennas made for
use with this units? (circular pol?)

Thanks for any help.

--Gary
N1BIP

1203. GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-04 21:27:31 UTC
From: george@partech.com
Message-ID: <george-0408941738190001@192.133.63.110>
Source record: 27157
Cross-posted to: sci.geo.satellite-nav,rec.radio.amateur.space

Is anyone aware of any GPS base stations in the Scranton PA area? We have some survey work and are contemplating using a GPS receiver (need differential for better accuracy) to support the effort. We would like to know if there is a base station near, accuracy, cost of access, etc. Or is there another alternative that would give 1-2m accuracy in real-time? Any help would be appreciated.

--
George Brown Voice: 315-738-0600x250
8383 Seneca Turnpike FAX: 315-738-8304
New Hartford, NY 13413-4991 e-mail: george@partech.com

1204. HELP NOAA Series

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 00:06:50 UTC
From: ag381@FreeNet.Carleton.CA
Message-ID: <Cu1CBE.BIM@freenet.carleton.ca>
Source record: 27159

Where can I find data on what these sats transmit ?I mean formal data useful
for IR calibration and any other data such as perhaps telemetry data.
Please post response and thanks in advance!

1205. ORBS$217.MICRO.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 04:32:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-217.d.1994@ampr.org>
Source record: 27084
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB KEPS @ AMSAT $ORBS-217.D
Orbital Elements 217.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.D
TO ALL RADIO AMATEURS BT

For the past several weeks the keps for KO25 have not been producing accurate AOS, TCA, and LOS times. It is my belief that a more accurate set of keps for KO25 is the object NASA lists as Catalog Number 22828. W5IU, K5EKH, KG5OA, and myself have confirmed this by monitoring numerous Cat No. 22828 passes. Below is the current keps for the object with Cat. # 22828. Try these out in your tracking program and see if they do a better job for KO25. Please leave a message on KO23 or KO25 to let me know how this set works.
73 Ray, WA5QGD

Satellite: UO-14
Catalog number: 20437
Epoch time: 94213.78039282
Element set: 15
Inclination: 98.5893 deg
RA of node: 297.9372 deg
Eccentricity: 0.0011963
Arg of perigee: 58.8472 deg
Mean anomaly: 301.3881 deg
Mean motion: 14.29850974 rev/day
Decay rate: 1.0e-07 rev/day^2
Epoch rev: 23610
Checksum: 317

Satellite: AO-16
Catalog number: 20439
Epoch time: 94213.27445779
Element set: 813
Inclination: 98.5979 deg
RA of node: 298.7190 deg
Eccentricity: 0.0012267
Arg of perigee: 60.0425 deg
Mean anomaly: 300.1970 deg
Mean motion: 14.29904960 rev/day
Decay rate: 3.0e-08 rev/day^2
Epoch rev: 23604

Checksum: 313

Satellite: DO-17
Catalog number: 20440
Epoch time: 94213.78413741
Element set: 814
Inclination: 98.5988 deg
RA of node: 299.5608 deg
Eccentricity: 0.0012401
Arg of perigee: 58.0788 deg
Mean anomaly: 302.1597 deg
Mean motion: 14.30044782 rev/day
Decay rate: 7.0e-08 rev/day^2
Epoch rev: 23613
Checksum: 309

Satellite: WO-18
Catalog number: 20441
Epoch time: 94213.27050758
Element set: 816
Inclination: 98.5965 deg
RA of node: 299.0502 deg
Eccentricity: 0.0012910
Arg of perigee: 60.7618 deg
Mean anomaly: 299.4853 deg
Mean motion: 14.30018823 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 23606
Checksum: 298

Satellite: LO-19
Catalog number: 20442
Epoch time: 94213.73539692
Element set: 812
Inclination: 98.5995 deg
RA of node: 299.7793 deg
Eccentricity: 0.0013267
Arg of perigee: 58.3596 deg
Mean anomaly: 301.8868 deg
Mean motion: 14.30115609 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 23614
Checksum: 336

Satellite: UO-22
Catalog number: 21575
Epoch time: 94213.74571854
Element set: 517
Inclination: 98.4322 deg
RA of node: 287.3167 deg
Eccentricity: 0.0007877

Arg of perigee: 147.7411 deg
Mean anomaly: 212.4257 deg
Mean motion: 14.36925651 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 15962
Checksum: 316

Satellite: KO-23
Catalog number: 22077
Epoch time: 94213.41306658
Element set: 412
Inclination: 66.0808 deg
RA of node: 185.2892 deg
Eccentricity: 0.0015350
Arg of perigee: 275.1393 deg
Mean anomaly: 84.7872 deg
Mean motion: 12.86286851 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9260
Checksum: 311

Satellite: AO-27
Catalog number: 22825
Epoch time: 94213.65198693
Element set: 310
Inclination: 98.6511 deg
RA of node: 288.9979 deg
Eccentricity: 0.0009583
Arg of perigee: 74.8438 deg
Mean anomaly: 285.3810 deg
Mean motion: 14.27630722 rev/day
Decay rate: 7.0e-08 rev/day^2
Epoch rev: 4417
Checksum: 335

Satellite: IO-26
Catalog number: 22826
Epoch time: 94214.19032026
Element set: 310
Inclination: 98.6515 deg
RA of node: 289.5766 deg
Eccentricity: 0.0010151
Arg of perigee: 76.1180 deg
Mean anomaly: 284.1130 deg
Mean motion: 14.27735137 rev/day
Decay rate: -9.0e-08 rev/day^2
Epoch rev: 4425
Checksum: 279

Satellite: KO-25
Catalog number: 22830

Epoch time: 94213.62991027
Element set: 315
Inclination: 98.5517 deg
RA of node: 285.7863 deg
Eccentricity: 0.0012449
Arg of perigee: 45.9554 deg
Mean anomaly: 314.2653 deg
Mean motion: 14.28060707 rev/day
Decay rate: -3.5e-07 rev/day^2
Epoch rev: 4418
Checksum: 308

Satellite: 22828
Catalog number: 22828
Epoch time: 94213.76963000
Element set: 288
Inclination: 98.6480 deg
RA of node: 289.1772 deg
Eccentricity: 0.0011104
Arg of perigee: 62.6119 deg
Mean anomaly: 297.6185 deg
Mean motion: 14.28061411 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 1228
Checksum: 312

/EX

1206. ORBS$217.WEATH.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 04:34:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-217.w.1994@ampr.org>
Source record: 27082
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-217.W
Orbital Elements 217.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94215.73515055
Element set: 901
Inclination: 99.0450 deg
RA of node: 266.7740 deg
Eccentricity: 0.0015871
Arg of perigee: 84.8632 deg
Mean anomaly: 275.4348 deg
Mean motion: 14.13633304 rev/day
Decay rate: 1.17e-06 rev/day^2
Epoch rev: 49697
Checksum: 317

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94215.76693453
Element set: 797
Inclination: 98.5081 deg
RA of node: 223.3165 deg
Eccentricity: 0.0012845
Arg of perigee: 186.3620 deg
Mean anomaly: 173.7398 deg
Mean motion: 14.24900734 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 40927
Checksum: 332

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94215.49523818
Element set: 356
Inclination: 82.5407 deg
RA of node: 230.9503 deg
Eccentricity: 0.0018360
Arg of perigee: 50.0231 deg
```

Mean anomaly: 310.2527 deg
Mean motion: 13.84719219 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 32890
Checksum: 289

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94213.59427610
Element set: 309
Inclination: 82.5400 deg
RA of node: 291.5503 deg
Eccentricity: 0.0017190
Arg of perigee: 144.8154 deg
Mean anomaly: 215.4104 deg
Mean motion: 13.16968250 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28923
Checksum: 280

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94215.72629249
Element set: 719
Inclination: 99.1755 deg
RA of node: 205.8097 deg
Eccentricity: 0.0012225
Arg of perigee: 4.3041 deg
Mean anomaly: 355.8230 deg
Mean motion: 14.13007420 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 30185
Checksum: 279

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94213.75597542
Element set: 310
Inclination: 82.5213 deg
RA of node: 107.5997 deg
Eccentricity: 0.0015552
Arg of perigee: 95.1060 deg
Mean anomaly: 265.1868 deg
Mean motion: 13.84370156 rev/day
Decay rate: 7.8e-07 rev/day^2
Epoch rev: 27399
Checksum: 330

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94216.17052536

Element set: 106
Inclination: 82.5405 deg
RA of node: 236.7979 deg
Eccentricity: 0.0005331
Arg of perigee: 169.6805 deg
Mean anomaly: 190.4389 deg
Mean motion: 13.04422901 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22915
Checksum: 286

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94213.41003535
Element set: 813
Inclination: 82.5455 deg
RA of node: 172.5483 deg
Eccentricity: 0.0017266
Arg of perigee: 24.6776 deg
Mean anomaly: 335.5206 deg
Mean motion: 13.84189091 rev/day
Decay rate: -2.9e-07 rev/day^2
Epoch rev: 20687
Checksum: 306

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94215.88224815
Element set: 31
Inclination: 98.8366 deg
RA of node: 234.5011 deg
Eccentricity: 0.0014887
Arg of perigee: 239.5385 deg
Mean anomaly: 120.4308 deg
Mean motion: 14.01350503 rev/day
Decay rate: -1.99e-06 rev/day^2
Epoch rev: 20038
Checksum: 293

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94213.65208044
Element set: 821
Inclination: 82.5269 deg
RA of node: 109.8175 deg
Eccentricity: 0.0012367
Arg of perigee: 286.6921 deg
Mean anomaly: 73.2884 deg
Mean motion: 13.83587320 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 19404

Checksum: 311

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94213.31479971
Element set: 720
Inclination: 82.5437 deg
RA of node: 137.6981 deg
Eccentricity: 0.0014536
Arg of perigee: 72.5269 deg
Mean anomaly: 287.7438 deg
Mean motion: 13.16463399 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15729
Checksum: 325

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94215.74541817
Element set: 123
Inclination: 98.6148 deg
RA of node: 242.4707 deg
Eccentricity: 0.0013903
Arg of perigee: 97.3891 deg
Mean anomaly: 262.8867 deg
Mean motion: 14.22434851 rev/day
Decay rate: 1.14e-06 rev/day^2
Epoch rev: 16726
Checksum: 307

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94216.15247496
Element set: 729
Inclination: 82.5535 deg
RA of node: 82.8772 deg
Eccentricity: 0.0014667
Arg of perigee: 73.7291 deg
Mean anomaly: 286.5437 deg
Mean motion: 13.16832975 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14277
Checksum: 338

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94213.36733443
Element set: 322
Inclination: 82.5485 deg
RA of node: 170.6331 deg
Eccentricity: 0.0023958

```
Arg of perigee: 97.1572 deg
Mean anomaly: 263.2315 deg
Mean motion: 13.83011259 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 4633
Checksum: 284

/EX
```

1207. ORBS$217.MISC.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 04:35:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-217.m.1994@ampr.org>
Source record: 27083
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-217.M
Orbital Elements 217.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94213.63587076
Element set: 303
Inclination: 98.6464 deg
RA of node: 289.0556 deg
Eccentricity: 0.0011121
Arg of perigee: 64.8056 deg
Mean anomaly: 295.4279 deg
Mean motion: 14.28035335 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 4418
Checksum: 304

Satellite: MIR
Catalog number: 16609
Epoch time: 94215.25868965
Element set: 695
Inclination: 51.6479 deg
RA of node: 310.9106 deg
Eccentricity: 0.0001314
Arg of perigee: 199.0571 deg
Mean anomaly: 161.0371 deg
Mean motion: 15.56735880 rev/day
Decay rate: 3.454e-05 rev/day^2
Epoch rev: 48335
Checksum: 319

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94215.55612231
Element set: 514
Inclination: 28.4707 deg
RA of node: 291.6986 deg
Eccentricity: 0.0005951
Arg of perigee: 222.2340 deg
```

Mean anomaly: 137.7788 deg
Mean motion: 14.90649965 rev/day
Decay rate: 3.76e-06 rev/day^2
Epoch rev: 3646
Checksum: 313

Satellite: GRO
Catalog number: 21225
Epoch time: 94213.54285849
Element set: 122
Inclination: 28.4628 deg
RA of node: 277.2327 deg
Eccentricity: 0.0003053
Arg of perigee: 8.0790 deg
Mean anomaly: 351.9857 deg
Mean motion: 15.41105823 rev/day
Decay rate: 1.811e-05 rev/day^2
Epoch rev: 6394
Checksum: 285

Satellite: UARS
Catalog number: 21701
Epoch time: 94213.60346557
Element set: 562
Inclination: 56.9863 deg
RA of node: 337.0641 deg
Eccentricity: 0.0005480
Arg of perigee: 110.3085 deg
Mean anomaly: 249.8537 deg
Mean motion: 14.96580625 rev/day
Decay rate: 2.536e-05 rev/day^2
Epoch rev: 15773
Checksum: 306

/EX

1208. DSP Radio Shack

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 12:34:05 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940805123405@ken_durham.sc.ti.com>
Source record: 27070

Radio Shack has a DSP box called DSP40 that is intended for SSB and CW noise and hetrodyne reduction. It has a 5W amp and speaker built in, a 3 position switch for bandwidth, and another for mode. The price is $79.95 and they had one in stock at the store I tried. I bought one and will try it out on AO-10 and AO-13 this weekend. WATCH HERE FOR THE PRAISE OR SCORN MESSAGE MONDAY.

KEN K5MBV

1209. Request for info.

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 13:13:45 UTC
From: rod@itata.disca.utfsm.cl
Message-ID: <31tdu9$nbu@manutara.inf.utfsm.cl>
Source record: 27158

[No readable article body recovered]

1210. * SpaceNews 08-Aug-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 14:34:14 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0808.1994@ampr.org>
Source record: 27160
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0808
* SpaceNews 08-Aug-94 *

BID: $SPC0808

=========
SpaceNews
=========

MONDAY AUGUST 8, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* DOVE NEWS *
=============
Jim White reports that DOVE is running a new set of software that tests the
digital to analog converter and other hardware and software capabilities of
the satellite. DOVE now transmits digitally generated tones through the DAC
and exercises software that implements two way communications between
on-board processors.

[Info via WD0E]

* REVISED AO-13 SCHEDULE *
==========================
A revised AO-13 transponder mode schedule for 1994 Sep 12 - Dec 19 is
presented below.

During the severe eclipses at the end of October, the mode-B transponder
will be ON from MA 0 to MA 30.

An expedition to The Gambia (C56) coincides with this period, and this
change is in response to its specific request.

N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19

The battery charge state is of paramount importance during eclipse seasons.
As always the command team may have to have to make temporary changes to the
published schedule. In that case we will try to minimise the inconvenience,

setting Mode-B OFF from MA 230-256 in the first instance.

Please don't rely on gossip and rumour! Continuous up to date information about AO-13 operations is always available on the beacons, 145.812 MHz or 2400.664 MHz in CW at 0 & 30 minutes past the hour, RTTY at 15 & 45 minutes past the hour and 400 bps PSK otherwise. These bulletins are also posted to Internet, ANS, Packet, PacSats etc, and many international newsletters. A 400 bps PSK decoder is available from G3RUH and several DSP products; display software P3C.EXE etc from many Amsat groups.

The active command stations are listed below, and constructive feedback about operations is always welcome.

Peter DB2OS @ DB0FAU.#NDS.DEU.EU
James G3RUH @ GB7DDX.#22.GBR.EU
Graham VK5AGR @ VK5WI.#ADL.#SA.AUS.OC

The above may also be reached via Internet (callsign@amsat.org) and KO-23. Please remember to state clearly a return address.

Notes prepared on behalf of, and in total cooperation with the above by:

James Miller G3RUH @ GB7DDX.#22.GBR.EU 1994 Aug 01 [Mon] 2014 utc

* WEBERSAT NEWS *
==========
WEBERSAT (WO-18) is broadcasting new pictures and light spectrometer data weekly. Software for the extraction, decoding, and display of spectrometer data, written by Bob (KB7KCL), is available by request on AO-16/LO-19, or directly from Weber State University. Monday utc, continues to be the day for the broadcast of the most recent spectrum, along with the week's WOD.

WeberWare 1.0, 1.2, 1.3, or a similar program is required for picture extraction, decoding, and display. WeberWare 1.3 is the current software version, and is available from Weber State University, AMSAT-NA, or AMSAT-UK. The most recent WeberSat double field image is number 9/13.

WO-18 is currently sending another portion of the base line survey of all telemetry channels. The selected channels are 0x36 54 +Y Temp, 0x37 55 PSKHPA Temp, 0x38 56 +Z Temp, 0x39 57 Horizon Sensor 1, 0x3A 58 Spectrometer Light Sensor, and 0x3B 59 Impact Sensor. This is an excellent opportunity for a student, group, or class to use this data to better understand WeberSat's experiments. WOD collection and broadcast will adhere to the following schedule:

28 July/Week2: **Variable (Requests for specific channels will be taken.)
04 August/Week3: BCR, 21 22 29 2F 33 36
11 August/Week4: Temperatures and impact detector, Ch# 14 2F 30 35 3B 40
18 August/Week1: Array currents, Ch# 26 27 28 29 2A 2B
25 August/Week2: **Variable (Requests for specific channels will be taken.)

**If no requests are received for specific WOD, then another part of the base line survey of all telemetry channels will be conducted.

[Info via Tom Davis, EA2CLS]

* AO-21 NEWS *
==============
RUDAK2>BEACON <UI>:
RUDAK-II Schedule: (down 145.987, up 435.016)
min/ 9 Beacon Mode
0..2 FM Repeater
3 Digital Audio
4..6 WEFAX Picture
7..8 AFSK TLM

* UNAMSAT-1 NEWS *
==================
The UNAMSAT-1 spacecraft is still on the ground and patiently awaiting for its launch, which should take place in the next few weeks. An operations guide for using the UNAMSAT-1 satellite will be available at the AMSAT Symposium in Orlando, Florida. Questions and comments can be directed by Internet mail to: unamsat@aleph.cinstrum.unam.mx.

[Info via XE1TU of the UNAMSAT-1 Team in Mexico City]

* APT WXSAT NEWS *
==================
The following weather satellite observations were made in Germany at a staon located at 50.7 degrees North Latitude, 7.1 East Longitude on 31-Jul-94:

NOAA-9: APT 137.62 *OFF*
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 *OFF*
Meteor 3-5: APT 137.85 On

NOAA-9 is off due to VHF-conflict with NOAA-11. Checked APT of Meteor 3-3, -4, and -6, no Signal 137.00-137.99 MHz from 06.30 UT until 19.00 UT.

[Info via Peter Henne]

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

KC5IHT K7MGB N7SMS WD9IYT

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org

SATELLITE : AMSAT-OSCAR-16

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1211. RE: Low-band Satellite transponders?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 14:48:01 UTC
From: pchien@ids.net
Message-ID: <31uivq$aqo@paperboy.ids.net>
Source record: 27067

The Russian RS-10/11 and RS-12/13 satellites use 10 meter
transceivers. A good description is in the "How to Use
the Amateur Radio Satellites" booklet which I mentioned in
a previous post.

Philip Chien
no sig yet

In Article <CtyzFr.Hqy@usenet.ucs.indiana.edu>
brandtk@silver.ucs.indiana.edu (Keith E. Brandt, MD) writes:
>I have heard there are two amateur satellites that work entirely on the low-
>bands (10 and 15 meters?). I would appreciate it if someone would let me know
>which satellites and what the passbands are. If there is an archive somewhere
>with this info, a pointer would be appreciated.
>
>Thanks,
>Keith
>
>
>==
>Keith E. Brandt, MD, WD9GET || Goodbye, cruel world that was my home-
> New Castle Family Physicians || there's cleaner space out here to roam.
> New Castle, Indiana || Put my feet up on the moons of Mars-
>brandtk@silver.ucs.indiana.edu || sit back, relax, and count the stars.
>==

1212. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 17:40:13 UTC
From: Ergin Guney <eg23+@andrew.cmu.edu>
Message-ID: <oiEbZxa00WB6BAu24y@andrew.cmu.edu>
Source record: 27061
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

Excerpts from netnews.rec.radio.amateur.space: 4-Aug-94 GPS base stations in Scrant.. by George Brown@partech.com
> Is anyone aware of any GPS base stations in the Scranton PA area? We have
> some survey work and are contemplating using a GPS receiver (need
> differential for better accuracy) to support the effort. We would like to
> know if there is a base station near, accuracy, cost of access, etc. Or
> is there another alternative that would give 1-2m accuracy in real-time?
> Any help would be appreciated.

Either you have been misinformed, or I am missing something big. I pretty well know that GPS signals aren't transmitted by any "base stations" on land. They come from 12 or so satellites that are circling the earth on low polar orbits. The receiver works by receiving the signals from any three of these satellites at a given moment (which is guaranteed on any point on the earth, due to the orbital configuration of the satellites). Therefore, you don't have to worry about access to GPS signals no matter where you are; New York City or Tibet doesn't make any difference.

Unless you're talking about some other GPS ("General Pinpointing Service"? :)) or a special land-based factor about GPS signals that I wasn't aware of (like what you mean by "differential"), I am pretty sure that what I have explained here is accurate.

Ergin Guney

1213. Re: GPS Freq and antenna questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 17:47:40 UTC
From: Ergin Guney <eg23+@andrew.cmu.edu>
Message-ID: <IiEbgwi00WB6NAu3FL@andrew.cmu.edu>
Source record: 27064

Excerpts from netnews.rec.radio.amateur.space: 4-Aug-94 GPS Freq and antenna questions by Gary Delong@ctron.com
> The questions: What freq range(s) do the GPS transmiters use?
> and, is there anything "special" in the antennas made for
> use with this units? (circular pol?)

Here is the only GPS frequency information that I have on hand. This is from a public domain frequency list named Scanner Searchers Guide by N5OWK dated January 1990, which I downloaded from this newsgroup or a similar one:

1575.42 MHz is the Navstar Global Positioning System (GPS) frequency L1, and 1227.6 MHz is L2.

That's all it says. I hope this helps a little. But I won't be able to help you about the antenna at all, I'm afraid.

Ergin Guney

1214. Info request

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 19:03:18 UTC
From: rod@itata.disca.utfsm.cl
Message-ID: <31u2dm$9lf@manutara.inf.utfsm.cl>
Source record: 27063

'lo all...
I guess this *must* be a FAQ... but I'm still looking for some
info and nothing have happened.
I'm just starting withn amateur-satellites and I'm looking for some
info to know what I have to do to work properly.
I've been hearing doved for some days... but now I want something
new. Anything will be very usefull so if you have some info please
e-mail me or post it in news.
Thanks in advance....
73 & DX from Chile....

Rodrigo E. Rodriguez.
CE 6 NUG
rod@itata.disca.utfsm.cl
rrodrigu@loa.disca.utfsm.cl

1215. Re: Oscar 10 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 19:29:06 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Aug5.192906.2994@gov.nt.ca>
Source record: 27062

In article <9408021550.ZM27670@SALCIUS2> Wayne_Estes@csg.mot.com (Wayne_Estes) writes:
>Question #1:
>
>The Satellite Experimenter's Handbook says not to use Oscar 10 if the beason
>doesn't transmit a pure tone. On Sunday night the beacon sounded very
>distorted. As an experiment I tried sending a CQ in the passband and could
>hear myself on the downlink loud and clear. (nobody else was on the
>satellite)
>
>Question #1:
>Is it really true that I should avoid transmitting to Oscar 10 when the
>beacon does not transmit a pure tone?
>
>
>Instant Track indicates that the Oscar 10 antennas are almost always severely
>off-pointed from earth (more than 90 degrees most of the time)
>
>Question #2:
>Are the Oscar 10 antennas omnidirectional enough to allow reliable contacts
>when the offpointing angle is large?
>
> - Wayne Estes WD5FFH wayne@csg.mot.com
>
>--
>Wayne A. Estes
>Motorola Asia-Pacific Cellular Subscriber Division
>600 N. U.S. Hwy. 45, Rm. A-S345
>Libertyville, IL 60048-1286
>PHONE: 1-708-523-2386 Z-MAIL: wayne@csg.mot.com
>FAX: 1-708-523-8795 POST: w10191@email.mot.com

When the beacon on AO-10 starts FM'ing it usually indicates that the system voltage is getting lower. In order to conserve the batteries it is a good idea not to use the transponder. The fact that most people observe this and that AO-10 is usually pretty quiet (few users) has contributed to its continued operation. How it will survive between the crash of AO-13 and the launch of the new P3D satellite remains to be seen. I imagine it will see a lot of use as the only high orbit bird available during this time.

Since the computer on AO-10 succumbed to radiation a few years ago, there is no way for ground controllers to change the spacecraft's orientation. As the orientation slowly drifts the pointing angle as well as the percentage of sun striking the solar panels also changes. This is why the strength of the downlink

varies considerably month to month depending on the antenna
direction and the amount of power available to charge the batteries.
It is possible, based on the last known attitude of AO-10 to
calculate the current and future attitudes. Currently the
ALON/ALAT are approx. 218/-15 with an illumination of 87% (info
courtesy G3RUH). The illumination will decline over the next
two months, down to 11% in October. By January it will be back
up to almost 100% and will continue on this 6 month cycle.
The ALON is slowly decreasing (201 in Jan) and the ALAT is slowly
increasing (-19 in Jan).

Perhaps NASA will donate a shuttle mission to replace the computer
with a newer radiation-hardened unit? <g>

73

==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

1216. Re: Oscar 10 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-05 23:35:12 UTC
From: greg@core.rose.hp.com
Message-ID: <Cu35Ip.4GB@icon.rose.hp.com>
Source record: 27075

Eeek!

: users) has contributed to its continued operation. How it will
: survive between the crash of AO-13 and the launch of the new P3D
: satellite remains to be seen. I imagine it will see a lot of

When will (did?) AO-13 "crash"? Are we talking physically or is there some other resource which will run out (besides altitude)? I know P3D is a couple of years off, so how big is this window going to be?

Greg KD6KGW

1217. STS-65 Commemorative TLI Burn

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 02:49:06 UTC
From: tstader@aol.com
Message-ID: <31utn2$o5d@search01.news.aol.com>
Source record: 27073

I am re-posting this note from a message I got on AOL. Please reply directly to Dan Adamo at his AOL account: Adamod@aol.com

Text follows:
==========
Date: Thu, Aug 4, 1994 7:43 PM EDT
From: Adamod
Subj: STS-65 Commemorative TLI Burn

File: TLI.sit (58540 bytes)

MacSPOC Users-

During STS-65, you'll recall MacMission Control supported targeting of a commemorative TransLunar Injection (TLI) burn. Time of IGnition (TIG) for this burn was 25 years to the minute after a similar TLI was performed by Apollo-11 to break free of low earth orbit. The commemorative TLI was tageted to reach a point 100 miles above the moon's farside 25 years to the minute after Apollo-11's Lunar Orbit Insertion (LOI) burn TIG.

With targets from MacMission Control, Flight Dynamics Officers (FDOs) in the real Mission Control filled out a Pre-Advisory Data (PAD) for the commemorative TLI burn. This PAD, together with plots of STS-65's post-TLI trajectory relative to the earth and moon, are enclosed as 3 TeachText documents for your viewing pleasure.

An image of the commemorative TLI PAD was uplinked as a FAX to the STS-65 crew around 8:30 AM CDT July 16, 25 years after Apollo-11 was launched. Upon receiving the PAD, STS-65 Commander Bob Cabana remarked, "Don't we wish!" Powered Explicit Guidance mode 7 (PEG 7) targets computed by MacMission Control appear on the PAD as an in-track speed increase of 9586.3 fps, a northward cross-track velocity change of 3073.7 fps, and a radial upward velocity change of 5944.0 fps. Using both Orbital Maneuvering System (OMS) engines for a total thrust of 12000 lbs, Columbia would have required a TLI burn duration (TGO) of 2 hrs 03 min 24 sec to build up these velocity changes. Actual OMS fuel available to Columbia at TLI TIG would have supported less than 5 min of 2-engine burn time, and most of this was allocated to STS-65 deorbit.

It's worth noting Apollo-11 weighed nearly 200000 lbs at TLI TIG, only about 45000 lbs less than Columbia's WT on the commemorative PAD. Unlike Columbia, however, about 75% of Apollo-11's weight was propellant to feed the Saturn IV-B's single J-2 engine during TLI. Because the J-2 developed about 200000 lbs of thrust, Apollo-11's TLI required less than 6 min to perform.

The 2 post-TLI plots are in the ecliptic plane. This is coincident with earth's orbit around the sun. The moon's orbit about earth is less than 5 deg from the ecliptic. The Vernal Equinox indicated on these plots is the Sun's apparent position as viewed from earth when Spring begins in March. The Sun's position in mid-July is also indicated on the plots.

Does anyone have a guess as to when the next (manned) TLI burn will be performed for real?

-Dan Adamo
==========
a file was attached which I will be glad to BinHex and e-mail to anyone that would like it.

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Internet: tstader@aol.com (files <28K) or
p00489@psilink.com (files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM

1218. MacSPOC updates

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 02:54:06 UTC
From: tstader@aol.com
Message-ID: <31uu0e$o95@search01.news.aol.com>
Source record: 27065

If there is enough of a desire to have them posted... I will post Dan Adamo's MacSPOC updates for the Shuttle missions as soon as they become available.

Here is the skinny of the Mac program from the AOL files description:

*** MacSPOC Info ***

Welcome to an enhanced awareness of satellites in earth orbit! MacSPOC (SPOC = Spacecraft Personal Orbit Computations) v1.5 is a commercial real time satellite trajectory display. Previous MacSPOC versions were evaluated by orbiting astronauts during the STS-41, STS-43, and STS-52 missions. MacSPOC continues to be used in control centers and schools across the country. The MacSPOCl v1.5 configuration regularly supports Mission Control planning for the Shuttle Amateur Radio Experiment (SAREX) program. A v1.1 package is available for downloading from AOL. It's similar to the MacSPOC version flown aboard STS-41 and is copyrighted freeware for you to "test drive".

By downloading your MacSPOC test drive, you agree to two restrictions. First, you may not disassemble or modify MacSPOC code. Second, although you may produce unlimited copies of your download, it may not be distributed to others for any fee or compensation.

Real world MacSPOC trajectory updates, called checkpoints, are uploaded during Space Shuttle missions and upon request. Because they're only about 500 bytes in size, checkpoints are easy to send and receive. To obtain free checkpoints, send your e-mail address via AOL to "AdamoD". If you'd also like to receive a free MacSPOC v1.5 brochure, include your name and mailing address too.

Two functionally identical MacSPOC v1.1 download packages are available to support various Macintosh models. Choose the "MacSPOCfpu.sit" package only if your Macintosh has a 6888x FPU (math co-processor) chip. Other models, including 68040-equipped machines running with cache memory OFF, can utilize the "MacSPOC+.sit" package. Both packages are compatible with either System 6 or System 7.

Your MacSPOC v1.1 download consists of four parts: the MacSPOC application, a world map bitmap file "SPOCMap", a database of STS-52 earth observation sites "Earth Obs", and a checkpoint formatting utility called "Convert2v1.1". To install MacSPOC v1.1 after your download is unstuffed, be sure at least the first three of these files reside in the same folder.

A quick hypothetical demo of MacSPOC displays can be obtained with the following steps. First, if a file named "MacSPOC.cp" exists in the folder occupied by MacSPOC, delete it, rename it, or drag it elsewhere. Next,

open (double-click) the MacSPOC application and await appearance of a dialog box with "Edit Liftoff GMT" as its heading. Click the "Check SV..." button, then click the "Save" button. A new dialog will appear, asking "Ready to Propagate State Vector?". Click the "Go!" button in this dialog, and you'll be off and running.

At some point prior to tracking a real satellite like a Space Shuttle, you should be sure your Macintosh system clock is set accurately via the Control Panel. Next, select "Time Zone..." from MacSPOC's "Update" menu. Click the radio button which pertains to the time zone your system clock is keeping, then click the "Save" button. Unless you lose your copy of MacSPOC, you'll need to repeat this procedure only when you change time zones in your system clock, as when you "fall back" to standard time the last Sunday in October.

All MacSPOC checkpoints are uploaded in v1.5 format. After downloading, you can translate a checkpoint to v1.1 format by using the Convert2v1.1 utility. Just load Convert2v1.1, then use it to open the downloaded v1.5 checkpoint. The checkpoint created by Convert2v1.1 can then be double-clicked or opened for processing by MacSPOC v1.1. The only information lost during this conversion process defines maneuvers which might be included to change the orbit originally defined in the checkpoint.
-Dan Adamo,
MacSPOC Developer

1219. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 03:52:41 UTC
From: oppedahl@panix.com
Message-ID: <31v1e9$s7c@panix2.panix.com>
Source record: 27074
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

In <oiEbZxa00WB6BAu24y@andrew.cmu.edu> Ergin Guney <eg23+@andrew.cmu.edu> writes:

>Excerpts from netnews.rec.radio.amateur.space: 4-Aug-94 GPS base
>stations in Scrant.. by George Brown@partech.com
>> Is anyone aware of any GPS base stations in the Scranton PA area? We have
>> some survey work and are contemplating using a GPS receiver (need
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>> know if there is a base station near, accuracy, cost of access, etc. Or
>> is there another alternative that would give 1-2m accuracy in real-time?
>> Any help would be appreciated.

>Either you have been misinformed, or I am missing something big. I
>pretty well know that GPS signals aren't transmitted by any "base
>stations" on land. They come from 12 or so satellites that are circling
>the earth on low polar orbits. The receiver works by receiving the
>signals from any three of these satellites at a given moment (which is
>guaranteed on any point on the earth, due to the orbital configuration
>of the satellites). Therefore, you don't have to worry about access to
>GPS signals no matter where you are; New York City or Tibet doesn't make
>any difference.

Well, actually about 24 satellites, but your general point is correct.

--
Carl Oppedahl AA2KW
Oppedahl & Larson (patent lawyers)
Yorktown Heights, NY
oppedahl@patents.com

1220. Re: What SAT's can I hear on a Scanner ?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 10:23:03 UTC
From: im3dman@aol.com
Message-ID: <31voa7$56s@search01.news.aol.com>
Source record: 27066

In article <2t2qdt$dih@freenet3.scri.fsu.edu>, bmm1@freenet3.scri.fsu.edu (Bruce M. Marshall) writes:

Do you ever run packet? Or catch weather pics? I'm working on the no code right now and would like input on the above subjects.
Thanks.
73
John

1221. Re: DSP Radio Shack

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 12:35:47 UTC
From: prvalko@vela.acs.oakland.edu
Message-ID: <320033$s4u@oak.oakland.edu>
Source record: 27069

Ken Durham (ken@fstop.csc.ti.com) wrote:
: Radio Shack has a DSP box called DSP40 that is intended for SSB and CW noise
: and hetrodyne reduction. It has a 5W amp and speaker built in, a 3 position
: switch for bandwidth, and another for mode. The price is $79.95 and they
: had one in stock at the store I tried. I bought one and will try it out
: on AO-10 and AO-13 this weekend. WATCH HERE FOR THE PRAISE OR SCORN
: MESSAGE MONDAY.

Sheeze Ken... where have you been? I've been LOVING my DSP40 from the
moment I got it, about 3 months ago.

BTW... there are not too many hetrodynes or AM carriers on the
satelites, I doubt you'll be impressed with its automatic notch filter,
which is its greatest feature. Try it on 40 meters some evening.

73 =paul= wb8zjl

1222. Re: MacSPOC updates

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 13:26:33 UTC
From: kleite@sentry.ndhm.gtegsc.com
Message-ID: <kleite-060894082633@155.95.178.234>
Source record: 27068

In article <31uu0e$o95@search01.news.aol.com>, tstader@aol.com (TSTADER)
wrote:

> If there is enough of a desire to have them posted... I will post Dan
> Adamo's MacSPOC updates for the Shuttle missions as soon as they become
> available.
>
> Here is the skinny of the Mac program from the AOL files description:
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> *** MacSPOC Info ***
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> only if your Macintosh has a 6888x FPU (math co-processor) chip. Other
> models, including 68040-equipped machines running with cache memory OFF,
> can utilize the "MacSPOC+.sit" package. Both packages are compatible with
> either System 6 or System 7.
>
> Your MacSPOC v1.1 download consists of four parts: the MacSPOC
> application, a world map bitmap file "SPOCMap", a database of STS-52 earth
> observation sites "Earth Obs", and a checkpoint formatting utility called

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> be sure at least the first three of these files reside in the same folder.
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> occupied by MacSPOC, delete it, rename it, or drag it elsewhere. Next,
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> dialog box with "Edit Liftoff GMT" as its heading. Click the "Check
> SV..." button, then click the "Save" button. A new dialog will appear,
> asking "Ready to Propagate State Vector?". Click the "Go!" button in this
> dialog, and you'll be off and running.
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> At some point prior to tracking a real satellite like a Space Shuttle, you
> should be sure your Macintosh system clock is set accurately via the
> Control Panel. Next, select "Time Zone..." from MacSPOC's "Update" menu.
> Click the radio button which pertains to the time zone your system clock
> is keeping, then click the "Save" button. Unless you lose your copy of
> MacSPOC, you'll need to repeat this procedure only when you change time
> zones in your system clock, as when you "fall back" to standard time the
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> utility. Just load Convert2v1.1, then use it to open the downloaded v1.5
> checkpoint. The checkpoint created by Convert2v1.1 can then be
> double-clicked or opened for processing by MacSPOC v1.1. The only
> information lost during this conversion process defines maneuvers which
> might be included to change the orbit originally defined in the
> checkpoint.
> -Dan Adamo,
> MacSPOC Developer

Can this program be found anywhere else besides AOL, like maybe at some
of the popular FTP site's (ie SUMEX,UCSD,OAKLAND) ????

****
Keith J Leite AA1JF
AX25 - AA1JF @ WA1PHY.#EMA.MA.USA.NA
AMPR - aa1jf@switch.sema.ampr.org
Internet - kleite@gtec3.ndhm.gtegsc.com

****

1223. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 15:14:04 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Aug6.151404.24486@ke4zv.atl.ga.us>
Source record: 27072
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

In article <oiEbZxa00WB6BAu24y@andrew.cmu.edu> Ergin Guney <eg23+@andrew.cmu.edu> writes:
>
>Excerpts from netnews.rec.radio.amateur.space: 4-Aug-94 GPS base
>stations in Scrant.. by George Brown@partech.com
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>> is there another alternative that would give 1-2m accuracy in real-time?
>> Any help would be appreciated.
>
>Either you have been misinformed, or I am missing something big. I
>pretty well know that GPS signals aren't transmitted by any "base
>stations" on land. They come from 12 or so satellites that are circling
>the earth on low polar orbits. The receiver works by receiving the
>signals from any three of these satellites at a given moment (which is
>guaranteed on any point on the earth, due to the orbital configuration
>of the satellites). Therefore, you don't have to worry about access to
>GPS signals no matter where you are; New York City or Tibet doesn't make
>any difference.
>
>Unless you're talking about some other GPS ("General Pinpointing
>Service"? :)) or a special land-based factor about GPS signals that I
>wasn't aware of (like what you mean by "differential"), I am pretty sure
>that what I have explained here is accurate.

You're missing something pretty big. Differential GPS is the system
whereby a GPS receiver at a known geographical benchmark continously
broadcasts it's position via radio. Receivers in the field then
combine the offset from known position reported by the benchmark
receiver with their current satellite reported position to defeat
the SA scatter deliberately introduced into the GPS satellite
system by the military. Most GPS receiver manufacturers, like Garmin
and Trimble, support differential GPS operation in their newer units.

Benchmark transmissions are becoming more common. Some (sponsored
by the FAA) are on commercial FM broadcast subcarriers, and others
are on land mobile, marine, or amateur frequencies. The FAA and the
Coast Guard are cooperating in setting up this system of benchmark
receivers so that precision aircraft and boat navigation under zero-zero
visibility conditions can be done. Some amateurs are also setting
up benchmark systems for amateur navigation experiments. Instead
of the typical civilian GPS navigational position uncertainty of
100 meters, differential GPS can offer position information accurate

to a few centimeters. This is vital for zero-zero capability since few runways are over 100 meters wide. It's also vital in some shipping channels, for precision mapping, and for positioning of equipment such as offshore drill rigs. And it's obviously necessary for land vehicle navigation since most roadways are only 18 feet wide and lanes are only 9 feet wide. Errors of 100 meters are unacceptable.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

1224. orbs$217.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 16:24:49 UTC
From: Doug Howard KG5OA <70233.3517@compuserve.com>
Message-ID: <$orbs-217.o.1994@ampr.org>
Source record: 27078
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-217.O
Orbital Elements 217.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94215.22805310
Element set: 295
Inclination: 27.0009 deg
RA of node: 314.8290 deg
Eccentricity: 0.6026240
Arg of perigee: 199.5326 deg
Mean anomaly: 120.6764 deg
Mean motion: 2.05881876 rev/day
Decay rate: -3.02e-06 rev/day^2
Epoch rev: 8375
Checksum: 286

Satellite: UO-11
Catalog number: 14781
Epoch time: 94213.04189469
Element set: 713
Inclination: 97.7856 deg
RA of node: 225.6656 deg
Eccentricity: 0.0012585
Arg of perigee: 122.2499 deg
Mean anomaly: 237.9928 deg
Mean motion: 14.69233978 rev/day
Decay rate: 6.7e-07 rev/day^2
Epoch rev: 55689
Checksum: 367

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94213.27359705
Element set: 932
Inclination: 82.9271 deg
RA of node: 295.5187 deg
Eccentricity: 0.0010141
Arg of perigee: 260.6002 deg
```

Mean anomaly: 99.4006 deg
Mean motion: 13.72339573 rev/day
Decay rate: 1.8e-07 rev/day^2
Epoch rev: 35609
Checksum: 298

Satellite: AO-13
Catalog number: 19216
Epoch time: 94215.93255462
Element set: 941
Inclination: 57.7516 deg
RA of node: 238.4314 deg
Eccentricity: 0.7222331
Arg of perigee: 347.2702 deg
Mean anomaly: 1.5691 deg
Mean motion: 2.09718789 rev/day
Decay rate: 3.63e-06 rev/day^2
Epoch rev: 4701
Checksum: 302

Satellite: FO-20
Catalog number: 20480
Epoch time: 94213.43350131
Element set: 710
Inclination: 99.0410 deg
RA of node: 356.7174 deg
Eccentricity: 0.0539898
Arg of perigee: 236.9611 deg
Mean anomaly: 117.8521 deg
Mean motion: 12.83226876 rev/day
Decay rate: -1.8e-07 rev/day^2
Epoch rev: 20993
Checksum: 303

Satellite: AO-21
Catalog number: 21087
Epoch time: 94216.14915277
Element set: 496
Inclination: 82.9459 deg
RA of node: 107.2296 deg
Eccentricity: 0.0034831
Arg of perigee: 313.1016 deg
Mean anomaly: 46.7226 deg
Mean motion: 13.74542801 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 17617
Checksum: 303

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94213.38545202

Element set: 713
Inclination: 82.9223 deg
RA of node: 337.9238 deg
Eccentricity: 0.0029475
Arg of perigee: 346.0088 deg
Mean anomaly: 14.0245 deg
Mean motion: 13.74044083 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 17485
Checksum: 294

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94205.08601395
Element set: 267
Inclination: 1.9520 deg
RA of node: 97.7392 deg
Eccentricity: 0.2917162
Arg of perigee: 186.8922 deg
Mean anomaly: 167.2050 deg
Mean motion: 1.42201946 rev/day
Decay rate: -1.42e-06 rev/day^2
Epoch rev: 172
Checksum: 281

/EX
SB KEPS @ AMSAT $ORBS-217.D
Orbital Elements 217.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.D
TO ALL RADIO AMATEURS BT

For the past several weeks the keps for KO25 have not been producing
accurate AOS, TCA, and LOS times. It is my belief that a more
accurate set of keps for KO25 is the object NASA lists as Catalog
Number 22828. W5IU, K5EKH, KG5OA, and myself have confirmed this by
monitoring numerous Cat No. 22828 passes. Below is the current keps
for the object with Cat. # 22828. Try these out in your tracking
program and see if they do a better job for KO25. Please leave a
message on KO23 or KO25 to let me know how this set works.
73 Ray, WA5QGD

Satellite: UO-14
Catalog number: 20437
Epoch time: 94213.78039282
Element set: 15
Inclination: 98.5893 deg
RA of node: 297.9372 deg
Eccentricity: 0.0011963
Arg of perigee: 58.8472 deg

Mean anomaly: 301.3881 deg
Mean motion: 14.29850974 rev/day
Decay rate: 1.0e-07 rev/day^2
Epoch rev: 23610
Checksum: 317

Satellite: AO-16
Catalog number: 20439
Epoch time: 94213.27445779
Element set: 813
Inclination: 98.5979 deg
RA of node: 298.7190 deg
Eccentricity: 0.0012267
Arg of perigee: 60.0425 deg
Mean anomaly: 300.1970 deg
Mean motion: 14.29904960 rev/day
Decay rate: 3.0e-08 rev/day^2
Epoch rev: 23604
Checksum: 313

Satellite: DO-17
Catalog number: 20440
Epoch time: 94213.78413741
Element set: 814
Inclination: 98.5988 deg
RA of node: 299.5608 deg
Eccentricity: 0.0012401
Arg of perigee: 58.0788 deg
Mean anomaly: 302.1597 deg
Mean motion: 14.30044782 rev/day
Decay rate: 7.0e-08 rev/day^2
Epoch rev: 23613
Checksum: 309

Satellite: WO-18
Catalog number: 20441
Epoch time: 94213.27050758
Element set: 816
Inclination: 98.5965 deg
RA of node: 299.0502 deg
Eccentricity: 0.0012910
Arg of perigee: 60.7618 deg
Mean anomaly: 299.4853 deg
Mean motion: 14.30018823 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 23606
Checksum: 298

Satellite: LO-19
Catalog number: 20442
Epoch time: 94213.73539692

Element set: 812
Inclination: 98.5995 deg
RA of node: 299.7793 deg
Eccentricity: 0.0013267
Arg of perigee: 58.3596 deg
Mean anomaly: 301.8868 deg
Mean motion: 14.30115609 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 23614
Checksum: 336

Satellite: UO-22
Catalog number: 21575
Epoch time: 94213.74571854
Element set: 517
Inclination: 98.4322 deg
RA of node: 287.3167 deg
Eccentricity: 0.0007877
Arg of perigee: 147.7411 deg
Mean anomaly: 212.4257 deg
Mean motion: 14.36925651 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 15962
Checksum: 316

Satellite: KO-23
Catalog number: 22077
Epoch time: 94213.41306658
Element set: 412
Inclination: 66.0808 deg
RA of node: 185.2892 deg
Eccentricity: 0.0015350
Arg of perigee: 275.1393 deg
Mean anomaly: 84.7872 deg
Mean motion: 12.86286851 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9260
Checksum: 311

Satellite: AO-27
Catalog number: 22825
Epoch time: 94213.65198693
Element set: 310
Inclination: 98.6511 deg
RA of node: 288.9979 deg
Eccentricity: 0.0009583
Arg of perigee: 74.8438 deg
Mean anomaly: 285.3810 deg
Mean motion: 14.27630722 rev/day
Decay rate: 7.0e-08 rev/day^2
Epoch rev: 4417

Checksum: 335

Satellite: IO-26
Catalog number: 22826
Epoch time: 94214.19032026
Element set: 310
Inclination: 98.6515 deg
RA of node: 289.5766 deg
Eccentricity: 0.0010151
Arg of perigee: 76.1180 deg
Mean anomaly: 284.1130 deg
Mean motion: 14.27735137 rev/day
Decay rate: -9.0e-08 rev/day^2
Epoch rev: 4425
Checksum: 279

Satellite: KO-25
Catalog number: 22830
Epoch time: 94213.62991027
Element set: 315
Inclination: 98.5517 deg
RA of node: 285.7863 deg
Eccentricity: 0.0012449
Arg of perigee: 45.9554 deg
Mean anomaly: 314.2653 deg
Mean motion: 14.28060707 rev/day
Decay rate: -3.5e-07 rev/day^2
Epoch rev: 4418
Checksum: 308

Satellite: 22828
Catalog number: 22828
Epoch time: 94213.76963000
Element set: 288
Inclination: 98.6480 deg
RA of node: 289.1772 deg
Eccentricity: 0.0011104
Arg of perigee: 62.6119 deg
Mean anomaly: 297.6185 deg
Mean motion: 14.28061411 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 1228
Checksum: 312

/EX
SB KEPS @ AMSAT $ORBS-217.W
Orbital Elements 217.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94215.73515055
Element set: 901
Inclination: 99.0450 deg
RA of node: 266.7740 deg
Eccentricity: 0.0015871
Arg of perigee: 84.8632 deg
Mean anomaly: 275.4348 deg
Mean motion: 14.13633304 rev/day
Decay rate: 1.17e-06 rev/day^2
Epoch rev: 49697
Checksum: 317

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94215.76693453
Element set: 797
Inclination: 98.5081 deg
RA of node: 223.3165 deg
Eccentricity: 0.0012845
Arg of perigee: 186.3620 deg
Mean anomaly: 173.7398 deg
Mean motion: 14.24900734 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 40927
Checksum: 332

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94215.49523818
Element set: 356
Inclination: 82.5407 deg
RA of node: 230.9503 deg
Eccentricity: 0.0018360
Arg of perigee: 50.0231 deg
Mean anomaly: 310.2527 deg
Mean motion: 13.84719219 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 32890
Checksum: 289

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94213.59427610
Element set: 309
Inclination: 82.5400 deg
RA of node: 291.5503 deg
Eccentricity: 0.0017190
Arg of perigee: 144.8154 deg
Mean anomaly: 215.4104 deg
Mean motion: 13.16968250 rev/day

Decay rate: 5.1e-07 rev/day^2
Epoch rev: 28923
Checksum: 280

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94215.72629249
Element set: 719
Inclination: 99.1755 deg
RA of node: 205.8097 deg
Eccentricity: 0.0012225
Arg of perigee: 4.3041 deg
Mean anomaly: 355.8230 deg
Mean motion: 14.13007420 rev/day
Decay rate: 7.5e-07 rev/day^2
Epoch rev: 30185
Checksum: 279

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94213.75597542
Element set: 310
Inclination: 82.5213 deg
RA of node: 107.5997 deg
Eccentricity: 0.0015552
Arg of perigee: 95.1060 deg
Mean anomaly: 265.1868 deg
Mean motion: 13.84370156 rev/day
Decay rate: 7.8e-07 rev/day^2
Epoch rev: 27399
Checksum: 330

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94216.17052536
Element set: 106
Inclination: 82.5405 deg
RA of node: 236.7979 deg
Eccentricity: 0.0005331
Arg of perigee: 169.6805 deg
Mean anomaly: 190.4389 deg
Mean motion: 13.04422901 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 22915
Checksum: 286

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94213.41003535
Element set: 813
Inclination: 82.5455 deg

RA of node: 172.5483 deg
Eccentricity: 0.0017266
Arg of perigee: 24.6776 deg
Mean anomaly: 335.5206 deg
Mean motion: 13.84189091 rev/day
Decay rate: -2.9e-07 rev/day^2
Epoch rev: 20687
Checksum: 306

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94215.88224815
Element set: 31
Inclination: 98.8366 deg
RA of node: 234.5011 deg
Eccentricity: 0.0014887
Arg of perigee: 239.5385 deg
Mean anomaly: 120.4308 deg
Mean motion: 14.01350503 rev/day
Decay rate: -1.99e-06 rev/day^2
Epoch rev: 20038
Checksum: 293

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94213.65208044
Element set: 821
Inclination: 82.5269 deg
RA of node: 109.8175 deg
Eccentricity: 0.0012367
Arg of perigee: 286.6921 deg
Mean anomaly: 73.2884 deg
Mean motion: 13.83587320 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 19404
Checksum: 311

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94213.31479971
Element set: 720
Inclination: 82.5437 deg
RA of node: 137.6981 deg
Eccentricity: 0.0014536
Arg of perigee: 72.5269 deg
Mean anomaly: 287.7438 deg
Mean motion: 13.16463399 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15729
Checksum: 325

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94215.74541817
Element set: 123
Inclination: 98.6148 deg
RA of node: 242.4707 deg
Eccentricity: 0.0013903
Arg of perigee: 97.3891 deg
Mean anomaly: 262.8867 deg
Mean motion: 14.22434851 rev/day
Decay rate: 1.14e-06 rev/day^2
Epoch rev: 16726
Checksum: 307

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94216.15247496
Element set: 729
Inclination: 82.5535 deg
RA of node: 82.8772 deg
Eccentricity: 0.0014667
Arg of perigee: 73.7291 deg
Mean anomaly: 286.5437 deg
Mean motion: 13.16832975 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14277
Checksum: 338

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94213.36733443
Element set: 322
Inclination: 82.5485 deg
RA of node: 170.6331 deg
Eccentricity: 0.0023958
Arg of perigee: 97.1572 deg
Mean anomaly: 263.2315 deg
Mean motion: 13.83011259 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 4633
Checksum: 284

/EX
SB KEPS @ AMSAT $ORBS-217.M
Orbital Elements 217.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829

Epoch time: 94213.63587076
Element set: 303
Inclination: 98.6464 deg
RA of node: 289.0556 deg
Eccentricity: 0.0011121
Arg of perigee: 64.8056 deg
Mean anomaly: 295.4279 deg
Mean motion: 14.28035335 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 4418
Checksum: 304

Satellite: MIR
Catalog number: 16609
Epoch time: 94215.25868965
Element set: 695
Inclination: 51.6479 deg
RA of node: 310.9106 deg
Eccentricity: 0.0001314
Arg of perigee: 199.0571 deg
Mean anomaly: 161.0371 deg
Mean motion: 15.56735880 rev/day
Decay rate: 3.454e-05 rev/day^2
Epoch rev: 48335
Checksum: 319

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94215.55612231
Element set: 514
Inclination: 28.4707 deg
RA of node: 291.6986 deg
Eccentricity: 0.0005951
Arg of perigee: 222.2340 deg
Mean anomaly: 137.7788 deg
Mean motion: 14.90649965 rev/day
Decay rate: 3.76e-06 rev/day^2
Epoch rev: 3646
Checksum: 313

Satellite: GRO
Catalog number: 21225
Epoch time: 94213.54285849
Element set: 122
Inclination: 28.4628 deg
RA of node: 277.2327 deg
Eccentricity: 0.0003053
Arg of perigee: 8.0790 deg
Mean anomaly: 351.9857 deg
Mean motion: 15.41105823 rev/day
Decay rate: 1.811e-05 rev/day^2

Epoch rev: 6394
Checksum: 285

Satellite: UARS
Catalog number: 21701
Epoch time: 94213.60346557
Element set: 562
Inclination: 56.9863 deg
RA of node: 337.0641 deg
Eccentricity: 0.0005480
Arg of perigee: 110.3085 deg
Mean anomaly: 249.8537 deg
Mean motion: 14.96580625 rev/day
Decay rate: 2.536e-05 rev/day^2
Epoch rev: 15773
Checksum: 306

/EX

1225. orbs$217.2l

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 16:25:17 UTC
From: Doug Howard KG5OA <70233.3517@compuserve.com>
Message-ID: <$orbs-217.n.1994@ampr.org>
Source record: 27077
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-217.N
2Line Orbital Elements 217.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX August 5, 1994
BID: $ORBS-217.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

For the past several weeks the keps for KO25 have not been producing
accurate AOS, TCA, and LOS times. It is my belief that a more
accurate set of keps for KO25 is the object NASA lists as Catalog
Number 22828. W5IU, K5EKH, KG5OA, and myself have confirmed this by
monitoring numerous Cat No. 22828 passes. Below is the current keps
for the object with Cat. # 22828. Try these out in your tracking
program and see if they do a better job for KO25. Please leave a
message on KO23 or KO25 to let me know how this set works.
73 Ray, WA5QGD

AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 83753
UO-11
1 14781U 84021B 94213.04189469 .00000067 00000-0 19144-4 0 7136
2 14781 97.7856 225.6656 0012585 122.2499 237.9928 14.69233978556892
RS-10/11
1 18129U 87054A 94213.27359705 .00000018 00000-0 35526-5 0 9324
2 18129 82.9271 295.5187 0010141 260.6002 99.4006 13.72339573356096
AO-13
1 19216U 88051B 94215.93255462 .00000363 00000-0 10000-4 0 9412
2 19216 57.7516 238.4314 7222331 347.2702 1.5691 2.09718789 47017
FO-20
1 20480U 90013C 94213.43350131 -.00000018 00000-0 39122-4 0 7108
2 20480 99.0410 356.7174 0539898 236.9611 117.8521 12.83226876209935
AO-21
1 21087U 91006A 94216.14915277 .00000093 00000-0 82657-4 0 4968
2 21087 82.9459 107.2296 0034831 313.1016 46.7226 13.74542801176172
RS-12/13
1 21089U 91007A 94213.38545202 .00000023 00000-0 87829-5 0 7133
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2 21089 82.9223 337.9238 0029475 346.0088 14.0245 13.74044083174854
ARSENE
1 22654U 93031B 94205.08601395 -.00000142 00000-0 00000 0 0 2672
2 22654 1.9520 97.7392 2917162 186.8922 167.2050 1.42201946 1729
UO-14
1 20437U 90005B 94213.78039282 .00000010 00000-0 20896-4 0 157
2 20437 98.5893 297.9372 0011963 58.8472 301.3881 14.29850974236108
AO-16
1 20439U 90005D 94213.27445779 .00000003 00000-0 18064-4 0 8137
2 20439 98.5979 298.7190 0012267 60.0425 300.1970 14.29904960236047
DO-17
1 20440U 90005E 94213.78413741 .00000007 00000-0 19603-4 0 8144
2 20440 98.5988 299.5608 0012401 58.0788 302.1597 14.30044782236137
WO-18
1 20441U 90005F 94213.27050758 .00000001 00000-0 17366-4 0 8164
2 20441 98.5965 299.0502 0012910 60.7618 299.4853 14.30018823236060
LO-19
1 20442U 90005G 94213.73539692 .00000021 00000-0 25060-4 0 8123
2 20442 98.5995 299.7793 0013267 58.3596 301.8868 14.30115609236140
UO-22
1 21575U 91050B 94213.74571854 .00000013 00000-0 18775-4 0 5177
2 21575 98.4322 287.3167 0007877 147.7411 212.4257 14.36925651159626
KO-23
1 22077U 92052B 94213.41306658 -.00000037 00000-0 10000-3 0 4123
2 22077 66.0808 185.2892 0015350 275.1393 84.7872 12.86286851 92607
AO-27
1 22825U 93061C 94213.65198693 .00000007 00000-0 20768-4 0 3105
2 22825 98.6511 288.9979 0009583 74.8438 285.3810 14.27630722 44179
IO-26
1 22826U 93061D 94214.19032026 -.00000009 00000-0 14086-4 0 3102
2 22826 98.6515 289.5766 0010151 76.1180 284.1130 14.27735137 44254
KO-25
1 22830U 93061H 94213.62991027 -.00000035 00000-0 33681-5 0 3156
2 22830 98.5517 285.7863 0012449 45.9554 314.2653 14.28060707 44189
OBJ 22828
1 22828U 93061F 94213.76963000 -.00000006 00000-0 15345-4 0 2881
2 22828 98.6480 289.1772 0011104 62.6119 297.6185 14.28061411 12286
NOAA-9
1 15427U 84123A 94215.73515055 .00000117 00000-0 86262-4 0 9019
2 15427 99.0450 266.7740 0015871 84.8632 275.4348 14.13633304496979
NOAA-10
1 16969U 86073A 94215.76693453 .00000036 00000-0 33488-4 0 7974
2 16969 98.5081 223.3165 0012845 186.3620 173.7398 14.24900734409276
MET-2/17
1 18820U 88005A 94215.49523818 .00000028 00000-0 11549-4 0 3562
2 18820 82.5407 230.9503 0018360 50.0231 310.2527 13.84719219328905
MET-3/2
1 19336U 88064A 94213.59427610 .00000051 00000-0 10000-3 0 3096
2 19336 82.5400 291.5503 0017190 144.8154 215.4104 13.16968250289235
NOAA-11
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1 19531U 88089A 94215.72629249 .00000075 00000-0 65427-4 0 7194
2 19531 99.1755 205.8097 0012225 4.3041 355.8230 14.13007420301857
MET-2/18
1 19851U 89018A 94213.75597542 .00000078 00000-0 56483-4 0 3105
2 19851 82.5213 107.5997 0015552 95.1060 265.1868 13.84370156273998
MET-3/3
1 20305U 89086A 94216.17052536 .00000044 00000-0 10000-3 0 1064
2 20305 82.5405 236.7979 0005331 169.6805 190.4389 13.04422901229155
MET-2/19
1 20670U 90057A 94213.41003535 -.00000029 00000-0 -39076-4 0 8133
2 20670 82.5455 172.5483 0017266 24.6776 335.5206 13.84189091206871
FY-1/2
1 20788U 90081A 94215.88224815 -.00000199 00000-0 -10331-3 0 311
2 20788 98.8366 234.5011 0014887 239.5385 120.4308 14.01350503200389
MET-2/20
1 20826U 90086A 94213.65208044 .00000094 00000-0 71501-4 0 8214
2 20826 82.5269 109.8175 0012367 286.6921 73.2884 13.83587320194046
MET-3/4
1 21232U 91030A 94213.31479971 .00000051 00000-0 10000-3 0 7205
2 21232 82.5437 137.6981 0014536 72.5269 287.7438 13.16463399157294
NOAA-12
1 21263U 91032A 94215.74541817 .00000114 00000-0 70397-4 0 1232
2 21263 98.6148 242.4707 0013903 97.3891 262.8867 14.22434851167266
MET-3/5
1 21655U 91056A 94216.15247496 .00000051 00000-0 10000-3 0 7291
2 21655 82.5535 82.8772 0014667 73.7291 286.5437 13.16832975142777
MET-2/21
1 22782U 93055A 94213.36733443 .00000042 00000-0 24627-4 0 3226
2 22782 82.5485 170.6331 0023958 97.1572 263.2315 13.83011259 46335
POSAT
1 22829U 93061G 94213.63587076 .00000017 00000-0 24413-4 0 3038
2 22829 98.6464 289.0556 0011121 64.8056 295.4279 14.28035335 44181
MIR
1 16609U 86017A 94215.25868965 .00003454 00000-0 54150-4 0 6952
2 16609 51.6479 310.9106 0001314 199.0571 161.0371 15.56735880483357
HUBBLE
1 20580U 90037B 94215.55612231 .00000376 00000-0 22280-4 0 5147
2 20580 28.4707 291.6986 0005951 222.2340 137.7788 14.90649965 36464
GRO
1 21225U 91027B 94213.54285849 .00001811 00000-0 36407-4 0 1228
2 21225 28.4628 277.2327 0003053 8.0790 351.9857 15.41105823 63949
UARS
1 21701U 91063B 94213.60346557 .00002536 00000-0 24185-3 0 5620
2 21701 56.9863 337.0641 0005480 110.3085 249.8537 14.96580625157736
/EX
```

1226. Student Space Action Announces Home Page

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 16:44:00 UTC
From: ssa@SEDS.LPL.Arizona.EDU
Message-ID: <320ekg$rr6@news.CCIT.Arizona.EDU>
Source record: 27071

STUDENT SPACE ACTION ANNOUNCES HOME PAGE!!
Student Space Action would like to announce the availability of their home page. First of all, Student Space Action is a growing national organization of students who's mission it is to educate people on the values and benefits space exploration has on our everyday lives and deliver a message to Congress on a regular basis that illustrates the strong student support for space exploration.

SSA's home page is where you can learn about the organization's projects, including their Online Space Station Petition, as well as other projects at universities around the country. Simply point your World Wide Web browser at the following URL:

http://seds.lpl.arizona.edu/~ssa/ssahomepage.html

Thank you for your support.

--
Student Space Action
"Don't Take Away Our Frontier!"
For general responses: ssa@seds.lpl.arizona.edu
For technical or policy inquiries: chrisl@bozo.lpl.arizona.edu
or gamageb@db.erau.edu
We will keep reaching for the stars....
Visit our homepage!
SSA Homepage

1227. re: MacSPOC

Newsgroup: rec.radio.amateur.space
Date: 1994-08-06 19:38:37 UTC
From: pchien@ids.net
Message-ID: <321obg$m9r@paperboy.ids.net>
Source record: 27076

MacSPOC is an incredible program. I've used many versions up
through version 1.5 and it's got features unavailable
in any other satellite tracking program I've seen. You can
input in an entire set of shuttle maneuvers, attitudes and burns
and macSpoc will tell you where the shuttle will end up - and
where it will be pointing! The program gives you a view out
the window showing you where each window is pointed on the Earth's
surface, and a simulated view which corresponds to the actual
fieled of view out of the astronaut's window. On extremely useful
feature for SAREX enthusiasts is the determinating of the point on
the Earth's surface where the shuttle's SAREX antenna is pointing.
For photography buffs the database include recommended shutter
settings for different earth obs targets.

The primary input for keplerian elements is in the M50 format, but
Dan has also added the capability to accept two line elements from
the standard Amsat format. One of the key features it is missing
though is the capability to select a satellite from a text file of
keps.

The key limitation to MacSPOC is that it's so specifically designed
for use by an astronaut in space (or a payload officer of flight
dynamic officer on the ground) that it's fairly difficult to use -
unless you're heavily into the shuttle program.

In any case it's extremely impressive, and the shareware version
is certainly worth looking at, even though it's an earlier version.

How often can you say that you've tried software which has actually
been used aboard the shuttle?

Philip Chien KC4YER
no sig yet - and yes I'm just a satisifed user without any financial
interest in MacSPOC or Dan Adamo.

1228. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-07 13:36:00 UTC
From: gerry@cs.tamu.edu
Message-ID: <322o00$qrg@news.tamu.edu>
Source record: 27079
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

I could have been missing something, but I suspect he was looking for access
to a differential reference station, like some of the new commercial systems
cropping up in FM subcarriers.

Oh, yes... US Army Corps of Engineers, and the Coast Guard have started
putting up LF/MF (~300 khz) differential systems along the coast.

73, gerry
--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

1229. Re: MacSPOC updates

Newsgroup: rec.radio.amateur.space
Date: 1994-08-07 13:59:01 UTC
From: tstader@aol.com
Message-ID: <322pb5$b3h@search01.news.aol.com>
Source record: 27080

In article <kleite-060894082633@155.95.178.234>,
kleite@sentry.ndhm.gtegsc.com (Keith J. Leite) writes:

Good question Keith.... does anyone know if they can be found at an
ftp'able site? If not... I'll check with Dan to see if he has any problem
with me sending the file to someone with ftp capabilities!

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Internet: tstader@aol.com (files <28K) or
p00489@psilink.com (files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM

1230. STS-65 Commemorative TLI Burn

Newsgroup: rec.radio.amateur.space
Date: 1994-08-07 14:09:07 UTC
From: tstader@aol.com
Message-ID: <322pu3$b9m@search01.news.aol.com>
Source record: 27081

reposted from AOL:
==========
Date: Thu, Aug 4, 1994 7:43 PM EDT
From: Adamod
Subj: STS-65 Commemorative TLI Burn
File: TLI.sit (58540 bytes)

MacSPOC Users-

During STS-65, you'll recall MacMission Control supported targeting of a commemorative TransLunar Injection (TLI) burn. Time of IGnition (TIG) for this burn was 25 years to the minute after a similar TLI was performed by Apollo-11 to break free of low earth orbit. The commemorative TLI was tageted to reach a point 100 miles above the moon's farside 25 years to the minute after Apollo-11's Lunar Orbit Insertion (LOI) burn TIG.

With targets from MacMission Control, Flight Dynamics Officers (FDOs) in the real Mission Control filled out a Pre-Advisory Data (PAD) for the commemorative TLI burn. This PAD, together with plots of STS-65's post-TLI trajectory relative to the earth and moon, are enclosed as 3 TeachText documents for your viewing pleasure.

An image of the commemorative TLI PAD was uplinked as a FAX to the STS-65 crew around 8:30 AM CDT July 16, 25 years after Apollo-11 was launched. Upon receiving the PAD, STS-65 Commander Bob Cabana remarked, "Don't we wish!" Powered Explicit Guidance mode 7 (PEG 7) targets computed by MacMission Control appear on the PAD as an in-track speed increase of 9586.3 fps, a northward cross-track velocity change of 3073.7 fps, and a radial upward velocity change of 5944.0 fps. Using both Orbital Maneuvering System (OMS) engines for a total thrust of 12000 lbs, Columbia would have required a TLI burn duration (TGO) of 2 hrs 03 min 24 sec to build up these velocity changes. Actual OMS fuel available to Columbia at TLI TIG would have supported less than 5 min of 2-engine burn time, and most of this was allocated to STS-65 deorbit.

It's worth noting Apollo-11 weighed nearly 200000 lbs at TLI TIG, only about 45000 lbs less than Columbia's WT on the commemorative PAD. Unlike Columbia, however, about 75% of Apollo-11's weight was propellant to feed the Saturn IV-B's single J-2 engine during TLI. Because the J-2 developed about 200000 lbs of thrust, Apollo-11's TLI required less than 6 min to perform.

The 2 post-TLI plots are in the ecliptic plane. This is coincident with earth's orbit around the sun. The moon's orbit about earth is less than 5 deg from the ecliptic. The Vernal Equinox indicated on these plots is the Sun's apparent position as viewed from earth when Spring begins in March.

The Sun's position in mid-July is also indicated on the plots.

Does anyone have a guess as to when the next (manned) TLI burn will be performed for real?

-Dan Adamo
==========

I'll be glad to send the Mac PICT file in a BinHex'd StuffIt to anyone who requests it. PLEASE send your request to my "other" account...

p00489@psilink.com

NOT here to my AOL account... the file is to big for that mailer!

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Internet: tstader@aol.com (files <28K) or
p00489@psilink.com (files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM
ka8scp@ka8scp.ampr.org [44.56.4.82]

1231. Question on AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 01:34:35 UTC
From: etuggle@auc.trw.com
Message-ID: <1994Aug8.013435.21380@auc.trw.com>
Source record: 27085

I'm kinda new to amateur radio and OSCAR. I am interested in using AO-21. I've been doing some reading about the LEO sats, and most of the information I've read indicate one should be able to work them with a vertical. I have however, been having a few problems. So, I thought I'd post a question or two.

Is it realistic to expect to work AO-21 with the following setup?

Icom 21WAT (modified to xmit 432-)
20 Watt amp
Dual band "Vent" antenna. (looks like a roof vent pipe)

Let me add I can copy AO-21 VERY well!! My guess is I'll need more than 20 watts. I am thinking about replacing the "Vent" antenna with a J-pole (the one described in the ARRL Handbook). The only problem there is that I would have to mount the antenna in the attic. (I live in a very restrictive area)

Like I said, my guess is I need more power. I hate to go out and buy a big amp if this isn't going to solve the problem however.

Does anyone have any experience working AO-21 with a vertical? If so how much power should I expect it to take? Anyone using the dual band J-Pole from the ARRL handbook inside an attic?

Thanks in advance for any help anyone can offer.

73,
Eddie
KB0LZZ, Parker CO

--
Eddie D. Tuggle, etuggle@dora.auc.trw.com | "There is nothing either good or
TRW Denver Operations | bad, but thinking makes it so."
16201 Centretech Pky / Aurora, CO 80011 | -- SHAKESPEARE
Voice: 303.360.4001 FAX: 303.360.4133 |

1232. AMSAT ANS-218 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 02:12:49 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-218.01.1994@ampr.org>
Source record: 27093
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-218.01
KO-25 KEPLERIAN ELEMENTS

HR AMSAT NEWS SERVICE BULLETIN 218.01 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-218.01

KO-25 NASA Keps Track The Wrong Satellite

For the past several weeks many amateurs have noted that the NASA keps for KO25 have not produced accurate AOS and LOS times observes AMSAT-NA Orbital Data Manager Ray Hoad (WA5QGD). With the help of W5IU, K5EKH, and KG5OA, numerous KO-25 passes have been observed in conjunction with other objects in the KO-25 launch group. The consensus of this study is that the object NASA tracks as Catalog #22828 may actually be KO25.

In order to help remove this confusion, the keplerian elements for Catalog #22828 will be included (for the near future) in the weekly kep-lerian element set published on INTERNET. Please post any comments on the accuracy of the Cat. #22828 keps in tracking of KO25 as messages addressed to WA5QGD on either KO-23 or KO-25 digital satellites. The NASA Orbital Information Group has been advised of the tracking problem with KO25.

Note: The most accurate way to determine whether a transmitting satellite fits a set of keplerian elements is to observe the frequency of the satellite's transmission at the Time of Closest Approach (TCA). For low orbit birds, this corresponds to the time of maximum elevation given by most tracking programs. At this time there will be no doppler shift and the transmission frequency should match the published channel frequency (assuming no shift due to other causes). If a set of keps meets these requirements, it is a good match for the satellite. This method will give more consistent results than the AOS/LOS method.

[The AMSAT News Serive (ANS) wishes to thank Ray Hoad (WA5QGD) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-218.02
SSTV ON OSCAR 13

HR AMSAT NEWS SERVICE BULLETIN 218.02 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-218.02

SSTV ON OSCAR 13

Slow scanners are invited to join the SSTV sessions on AMSAT-OSCAR-13
(AO-13). The frequency is 145.955 MHz. The Net meets at 45 minutes
before Mode S, and on Mode B following Mode S on Saturdays and Sundays.
Join these sessions or contact wb6llo@amsat.org for other skeds and he
will coordinate your efforts.

DATE TIME
13-AUG-1994 15:50UTC and 17:55 UTC
14-AUG-1994 14:43UTC and 16:48 UTC

Please disseminate widely: clubs, local nets, etc.

/EX
SB SAT @ AMSAT $ANS-218.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 218.03 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 6, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-218.03

Weekly OSCAR Status Reports: 06-AUG-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
==========
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse
seasons. As always the command team may have to have to make temporary
changes to the published schedule. In that case we will try to minimize
the inconvenience, setting Mode-B OFF from MA 230-256 in the first
instance.
==========
[G3RUH/DB2OS/VK5AGR]

DO-17: DOVE is running a new set of software that tests the
digital-to-analog converter (DAC) and other hardware and software cap-
abilities. It plays digitally generated tones through the DAC and exer-

cises software that implements two way communications between the on-board processors. [WD0E for the DOVE Team]

RS-10: RS-10 has been working very well. Lots of activity with 2 stations worked /MM I6KYL/MM EL27 and N1KTM/MM EL67. Also on the 28-JUL-94, WC9C heard the station KC6VRK who was on AO-13 as RS-10 pass underneath right after AO-13 went through its perigee; his signal was very strong on the 10M downlink. The CW Robot is back up and working just fine. Also, WA6ARA reports that RS-10 has been sending down excellent signals at his QTH with lots of stations using CW. [WC9C & WA6ARA]

AO-10: After last week's glowing report about AO-10 sending down excellent signals, ZL2TPO reports that AO-10 has started to "FM" very badly. Up until last week it has been operating quite well and there have been a number of stations operating. Please note that when AO-10 is "FMing," please refrain from using it. [ZL2TPO]

KO-25: WH6I reports that KO-25 was in some sort of "loader-mode" earlier in the week. Today, however, the BBS seemed to be working again, but he was unable to send any commands to it. WH6I has not seen anything to indicate what is going on. [WH6I]

LO-19: LUSAT-OSCAR-19 (LO-19) is still not running its BBS. [WH6I]

IO-27: WH6I still has not heard anything from ITAMSAT. [WH6I]

AO-16: Still going strong and very doing well. There is some gateway traffic on AO-16 but not enough to present any problem to other users and the file lifetime on the bird is still quite long. [WH6I]

KO-23: KO-23 is going strong and doing well. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1233. APT-Satellites: Report AUG 07, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 07:13:53 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-080894071625@oskar.gmd.de>
Source record: 27088

```
Observed at station 50.7 NLat, 7.1 ELon, AUG 07, 1994

NOAA-9: APT 137.62 *OFF*
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 3-5: APT 137.85 On

NOAA-9 remains off due to VHF-conflict with NOAA-11.
I did not check for Meteor 2-21, but it should be off
(I had to disconnect the receiver due to thunderstorm).

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

1234. REQ: How to subscribe to AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 09:03:51 UTC
From: dlong@146.230.160.13
Message-ID: <dlong.2.000910B4@146.230.160.13>
Source record: 27086

Please help,

I need to subscribe to AMSAT for keplerian elements, SpaceNews etc.
Will appreciate if you will reply via email.

ZS5FR

1235. REQ: How to subscribe to AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 09:06:26 UTC
From: dlong@146.230.160.13
Message-ID: <dlong.3.00091BC4@146.230.160.13>
Source record: 27087

Please help,

I need to subscribe to AMSAT for keplerian elements, SpaceNews etc.
Will appreciate if you will reply via email to dlong@elaine.ee.und.ac.za.

ZS5FR

1236. DSP40

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 09:27:27 UTC
From: ken@fstop.csc.ti.com
Message-ID: <940808092728@ken_durham.sc.ti.com>
Source record: 27092

I tried out the Radio Shack DSP40 on AO-10 and AO-13 over the weekend. It would make a good addition to an older receiver for adding bandpass filtering. There was no noticeable distortion, delay, or noise reduction. There may have been some rejection of hetrodynes, but I couldn't detect it. The unit works fine as a steep skirted filter with very little ringing.

This is a step in the right direction (low cost), but the next model may be A LITTLE more useful.

THESE OPINIONS EXPRESSED BY ME ARE MINE ONLY AND DO NOT REFLECT THOSE OF MY EMPLOYER.

oh well . . K5MBV
.....

1237. manual needed for ICOM IC-28H

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 11:00:57 UTC
From: pchien@ids.net
Message-ID: <3262n9$70v@paperboy.ids.net>
Source record: 27099

Does anybody have a manual for an ICOM IC-28H?

I just got one at the Jacksonville Hamfest, and need
to learn how to set it up for the SAREX frequencies.

Alternately - does anybody have a phone number for ICOM?

Philip Chien KC4YER
no sig yet

1238. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 11:58:17 UTC
From: worstb@iia.org
Message-ID: <3256kp$hb4@ankh.iia.org>
Source record: 27089
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

Carl Oppedahl (oppedahl@panix.com) wrote:
: In <oiEbZxa00WB6BAu24y@andrew.cmu.edu> Ergin Guney <eg23+@andrew.cmu.edu> writes:

: Well, actually about 24 satellites, but your general point is correct.

Acutually, at the current time there are 25.

1239. ARLK031 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 12:10:10 UTC
From: w1aw@arrl.org
Message-ID: <$arlk031.1994@ampr.org>
Source record: 27090
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK031
ARLK031 Keplerian data

ZCZC SK98
QST de W1AW
Keplerian Bulletin 31 ARLK031
>From ARRL Headquarters
Newington, CT August 6, 1994
To all radio amateurs

SB KEP ARL ARLK031
ARLK031 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM
STS-68
1 99968U 94230.76050690 .00169786 00000-0 85389-4 0 10
2 99968 57.0052 28.8010 0009698 270.9951 89.0013 16.20039161 62
AO-10
1 14129U 83058B 94195.81899517 -.00000239 00000-0 10000-3 0 2900
2 14129 27.0497 317.9184 6025942 194.3808 135.3303 2.05882029 55387
RS-10/11
1 18129U 87054A 94205.76394677 .00000021 00000-0 61233-5 0 9290
2 18129 82.9269 301.0678 0010302 284.6472 75.3539 13.72339428355066
UO-11
1 14781U 84021B 94206.57201705 .00000126 00000-0 29120-4 0 7113
2 14781 97.7853 219.4981 0012287 142.1150 218.0921 14.69232874555947
RS-12/13
1 21089U 91007A 94205.88513475 .00000042 00000-0 28212-4 0 7115
2 21089 82.9215 343.4852 0030108 6.5069 353.6469 13.74044138173828
AO-13
1 19216U 88051B 94205.91938835 .00000274 00000-0 10000-4 0 9355
2 19216 57.7565 240.1864 7222231 346.4624 1.6687 2.09718427 15306
UO-14
1 20437U 90005B 94206.22284695 -.00000006 00000-0 14630-4 0 131
2 20437 98.5894 290.4825 0012008 78.9012 281.3516 14.29850235235026
AO-16
1 20439U 90005D 94206.20702088 .00000003 00000-0 18130-4 0 8113
2 20439 98.5977 291.7399 0012239 79.4923 280.7641 14.29904338235030
```

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DO-17
1 20440U 90005E 94206.22761656 -.00000004 00000-0 15240-4 0 8125
2 20440 98.5991 292.0970 0012389 78.8466 281.4111 14.30043974235052
WO-18
1 20441U 90005F 94205.78381851 -.00000004 00000-0 15267-4 0 8142
2 20441 98.5990 291.6570 0012956 80.7533 279.5114 14.30018047234996
LO-19
1 20442U 90005G 94206.24921416 .00000001 00000-0 17383-4 0 8105
2 20442 98.5996 292.3827 0013298 79.1581 281.1094 14.30114763235079
FO-20
1 20480U 90013C 94206.26040988 -.00000051 00000-0 -35431-4 0 7081
2 20480 99.0420 350.8957 0539824 253.2264 100.8961 12.83226193209016
AO-21
1 21087U 91006A 94205.15751765 .00000094 00000-0 82657-4 0 4924
2 21087 82.9457 115.3614 0035527 343.6761 16.3239 13.74542534174664
UO-22
1 21575U 91050B 94205.73789110 .00000018 00000-0 20773-4 0 5157
2 21575 98.4330 279.4738 0007454 171.9232 188.2073 14.36924859158479
KO-23
1 22077U 92052B 94206.41547975 -.00000037 00000-0 10000-3 0 4102
2 22077 66.0810 199.9404 0015234 277.3412 82.5876 12.86286814 91707
KO-25
1 22830U 93061H 94206.20302620 -.00000021 00000-0 88397-5 0 3134
2 22830 98.5527 278.5145 0012526 66.4100 293.8394 14.28060612 43126
IO-26
1 22826U 93061D 94206.20110340 -.00000005 00000-0 15806-4 0 3085
2 22826 98.6520 281.6684 0010136 97.7120 262.5225 14.27734369 43113
AO-27
1 22825U 93061C 94206.22287297 -.00000014 00000-0 12265-4 0 3088
2 22825 98.6518 281.6465 0009366 94.4271 265.7975 14.27629859 43114
PO-28
1 22829U 93061G 94206.20886141 .00000012 00000-0 22305-4 0 3019
2 22829 98.6465 281.7033 0011077 84.7659 275.4787 14.28034406 43124
Mir
1 16609U 86017A 94204.92312268 .00002226 00000-0 37433-4 0 6898
2 16609 51.6480 2.6272 0002451 168.9704 191.1321 15.56655252481748

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
August and 9, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1240. satellites

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 14:52:07 UTC
From: cflarkie@sonalysts.com
Message-ID: <325gqn$brb@hatch.sonalysts.com>
Source record: 27091

If at all possible I was wondering whether there was a means of obtaining
*the location and imagery of any weather satellites that are still operational
The group that I am workig with will need the following information on imagery from
geostationary weather satellites:

1. Focal length of cameras (in pixels)

2. Aiming data for the cameras

3. Preprocessing of images

4. Scheduling of image transmissions

Any information pertaining to the preeceeding will be greatly appreciated.
Feel free to offer up any advise for other sources for this information.

cflarkie@Sonalysts.com.

****
Charles Larkie Sonalysts, Inc.
Email: cflarkie@sonalysts.com 215 Parkway North
Work: (203)442-4355 Waterford CT 06385
****

1241. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 14:56:06 UTC
From: mdf@vigard.mef.org
Message-ID: <1994Aug8.145606.4067@vigard.mef.org>
Source record: 27107
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>of the typical civilian GPS navigational position uncertainty of
>100 meters, differential GPS can offer position information accurate
>to a few centimeters.

not quiet yet ... present DGPS navigation accuracies are in the 4-8
metre range. for centimetre accuracies, GPS surveying techniques are
required and i believe they take some time; more than is available
in, say, landing a 747.

>Errors of 100 meters are unacceptable.

without doubt ... but an error one could live with if it was a
fundamental limitation of the equipment. that it is *deliberate*
makes the blood boil...
--
Matthew Francey mdf@vigard.mef.org ve3rqx@io.org
"live before you die" GPS(NAD27): N43o34.210' W079o34.563' +0093m

1242. Re: DSP40

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 16:13:16 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <325lig$clc@chnews.intel.com>
Source record: 27094

In article <940808092728@ken_durham.sc.ti.com>, <ken@fstop.csc.ti.com> writes:
> I tried out the Radio Shack DSP40 on AO-10 and AO-13 over the weekend. It
> would make a good addition to an older receiver for adding bandpass
> filtering.
> There was no noticeable distortion, delay, or noise reduction. There may
> have been some rejection of hetrodynes, but I couldn't detect it. The unit
> works fine as a steep skirted filter with very little ringing.
>
> This is a step in the right direction (low cost), but the next model may be
> A LITTLE more useful.
>
> THESE OPINIONS EXPRESSED BY ME ARE MINE ONLY AND DO NOT REFLECT
> THOSE OF MY EMPLOYER.
>
> oh well . . K5MBV
> .....
>
What is the A/D conversion, 8 or 16 bit?
Tom WB7ASR...

1243. Re: Question on AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 16:16:15 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <325m1p$clc@chnews.intel.com>
Source record: 27095

In article <1994Aug8.013435.21380@auc.trw.com>, <etuggle@auc.trw.com> writes:
>
> Does anyone have any experience working AO-21 with a vertical? If so
> how much power should I expect it to take? Anyone using the dual band
> J-Pole from the ARRL handbook inside an attic?
>

You most likley will never be able to work through AO-21 with 20 watts and
a vertical/J-pole. You will need at least 100+ watts into a 40+ ele yagi.
The only reason you need this type of station is because that is what others
are using. Those stations will caputre the birds input, thus you will never
be heard. Its a shame, because 20 watts with a vertical is really all you need.

Tom WB7ASR...

1244. DSP Radio Shack

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 16:40:00 UTC
From: MUENZLERK@uthscsa.EDU
Message-ID: <2E466083@msmail.uthscsa.edu>
Source record: 27097

>Ken Durham (ken@fstop.csc.ti.com) wrote:
>: Radio Shack has a DSP box called DSP40 that is intended for SSB and CW noise
>: and hetrodyne reduction. It has a 5W amp and speaker built in, a 3 position
>: switch for bandwidth, and another for mode. The price is $79.95 and they
>: had one in stock at the store I tried. I bought one and will try it out
>: on AO-10 and AO-13 this weekend. WATCH HERE FOR THE PRAISE OR SCORN
>: MESSAGE MONDAY.

Then Paul Wrote:
>
>Sheeze Ken... where have you been? I've been LOVING my DSP40 from the
>moment I got it, about 3 months ago.
>
>BTW... there are not too many hetrodynes or AM carriers on the
>satelites, I doubt you'll be impressed with its automatic notch filter,
>which is its greatest feature. Try it on 40 meters some evening.
>
>73 =paul= wb8zjl

I purchased a DSP-40 for about 3 months too. The only disappointment is the fact that it has no real noise filter in it. I think it states that it has a 20db noise reduction. BULL!!! It has NO noise filter! I have discussed this with the RS guys. They state that the 20db "noise reduction" is the average noise reduction over the audio spectrum if you take into account the frequencies outside of the filter's bandpass. In that case you can get that from a 7 element Chebyshev!! I was told that there have been numerous complaints on this problem, in future versions they will "reword" the specifications. Other than that, it is worth the $80.

Kevin

Legal stuff:
The above opinions are my own and not necessarily those of the staff, faculty, administration, or lab animals (woof!) of The University of Texas Health Science Center at San Antonio or anyone else who is not me.

Kevin R. Muenzler, WB5RUE The University of Texas Health
muenzlerk@uthscsa.edu Science Center at San Antonio,
Department of Computing Resources

```
** There is no such thing as a Monkey-Proof Program! **
** I can prove it! **
-----------------------------------------------------------------------
```

1245. Re: DSP40

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 18:51:27 UTC
From: wes@iphase.com
Message-ID: <325urf$act@que.iphase.com>
Source record: 27096

They use a CODEC chip to do the A/D. I found that the box is easly over driven. This of course causes disstortion. The removal of hetrodynes works great. Infact if you try listening to a cw signal in the ssb mode you will find it will get chopped up or removed depending on stenght of signal. Two things that fother me is the use of a mono head phone jack and the large difference in the audio level between phones and speaker. The headphone output was not design for the phones of the day.

Wes

WA5TKU

1246. 2 meter CW uplink

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 19:18:52 UTC
From: gerheim@sonalysts.com
Message-ID: <3260es$h9g@hatch.sonalysts.com>
Source record: 27098

Some authors have recommended using an FM HT for a CW uplink on 2 meters.
the problem with this is that many HT's take about 200 msec. to generate
a carrier from the time they are keyed on. This makes the CW uninteligable.
I also own a 20 watt amp for the HT, and would like to know if there's a way
to key the amp, or even key the RF going *to* the amp. I feel I'm within
a few $ of a decent 2 meter uplink, but can't get the pieces together.

The AMSAT answer would be to just buy an all-mode XCVR. Why spend $200 on a hobby
when you can just as easily spend $5000!? ;-)

73 - AL , N4QN

--
****
Al Gerheim Sonalysts, Inc.
Email: gerheim@sonalysts.com 215 Parkway North
Work: (203)442-4355 Waterford CT 06385
****

1247. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 22:39:10 UTC
From: Rich Roberts <rroberts@sigg.com>
Message-ID: <3265gu$n3e@sid.sigg.com>
Source record: 27101
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

I believe that there are currently 25 GPS satellites currently at an
altitude of 12,539 miles. Depending on the configuration and competion of
the GPS network the accuracy of any given location may vary.

Hope this helps.

Path: sid.sigg.com!uunet!europa.eng.gtefsd.com!MathWorks.Com!news.duke.edu!godot.cc.duq.ed
u!nntp.club.cc.cmu.edu!cantaloupe.srv.cs.cmu.edu!bb3.andrew.cmu.edu!andrew.cmu.edu!eg23+
From: Ergin Guney <eg23+@andrew.cmu.edu>
Newsgroups: rec.radio.amateur.space,sci.geo.satellite-nav
Subject: Re: GPS base stations in Scranton PA area?
Date: Fri, 5 Aug 1994 13:40:13 -0400
Organization: Masters student, Industrial Administration, Carnegie Mellon, Pittsburgh, PA
Lines: 27
Message-ID: <oiEbZxa00WB6BAu24y@andrew.cmu.edu>
NNTP-Posting-Host: po2.andrew.cmu.edu
In-Reply-To: <george-0408941738190001@192.133.63.110>
Xref: sid.sigg.com rec.radio.amateur.space:145 sci.geo.satellite-nav:305

Excerpts from netnews.rec.radio.amateur.space: 4-Aug-94 GPS base
stations in Scrant.. by George Brown@partech.com
> Is anyone aware of any GPS base stations in the Scranton PA area? We have
> some survey work and are contemplating using a GPS receiver (need
> differential for better accuracy) to support the effort. We would like to
> know if there is a base station near, accuracy, cost of access, etc. Or
> is there another alternative that would give 1-2m accuracy in real-time?
> Any help would be appreciated.

Either you have been misinformed, or I am missing something big. I
pretty well know that GPS signals aren't transmitted by any "base
stations" on land. They come from 12 or so satellites that are circling
the earth on low polar orbits. The receiver works by receiving the
signals from any three of these satellites at a given moment (which is
guaranteed on any point on the earth, due to the orbital configuration
of the satellites). Therefore, you don't have to worry about access to
GPS signals no matter where you are; New York City or Tibet doesn't make
any difference.

Unless you're talking about some other GPS ("General Pinpointing
Service"? :)) or a special land-based factor about GPS signals that I
wasn't aware of (like what you mean by "differential"), I am pretty sure
that what I have explained here is accurate.

Ergin Guney

1248. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 23:22:24 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Aug8.232224.14412@gov.nt.ca>
Source record: 27100
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

In article <31v1e9$s7c@panix2.panix.com> oppedahl@panix.com (Carl Oppedahl) writes:
>In <oiEbZxa00WB6BAu24y@andrew.cmu.edu> Ergin Guney <eg23+@andrew.cmu.edu> writes:
>
>>Excerpts from netnews.rec.radio.amateur.space: 4-Aug-94 GPS base
>>stations in Scrant.. by George Brown@partech.com
>>> Is anyone aware of any GPS base stations in the Scranton PA area? We have
>>> some survey work and are contemplating using a GPS receiver (need
>>> differential for better accuracy) to support the effort. We would like to
>>> know if there is a base station near, accuracy, cost of access, etc. Or
>>> is there another alternative that would give 1-2m accuracy in real-time?
>>> Any help would be appreciated.
>
>>Either you have been misinformed, or I am missing something big. I
>>pretty well know that GPS signals aren't transmitted by any "base
>>stations" on land. They come from 12 or so satellites that are circling
>>the earth on low polar orbits. The receiver works by receiving the
>>signals from any three of these satellites at a given moment (which is
>>guaranteed on any point on the earth, due to the orbital configuration
>>of the satellites). Therefore, you don't have to worry about access to
>>GPS signals no matter where you are; New York City or Tibet doesn't make
>>any difference.
>
>Well, actually about 24 satellites, but your general point is correct.
>
>
>--
>Carl Oppedahl AA2KW
>Oppedahl & Larson (patent lawyers)
>Yorktown Heights, NY
>oppedahl@patents.com

Actually, you're both kinda "out there" somewhere. Differential GPS
uses land based transmissions in conjunction with the GPS sattelites
to resolve position information to a few metres accuracy. See the
story in last month's 73 magazine for more details.
73
==========
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==========

1249. Re: Oscar 10 questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-08 23:31:08 UTC
From: ve8ev@gov.nt.ca
Message-ID: <1994Aug8.233108.14789@gov.nt.ca>
Source record: 27102

In article <Cu35Ip.4GB@icon.rose.hp.com> greg@core.rose.hp.com (Greg Dolkas) writes:
>Eeek!
>
>: users) has contributed to its continued operation. How it will
>: survive between the crash of AO-13 and the launch of the new P3D
>: satellite remains to be seen. I imagine it will see a lot of
>
>When will (did?) AO-13 "crash"? Are we talking physically or is there
>some other resource which will run out (besides altitude)? I know P3D
>is a couple of years off, so how big is this window going to be?
>
>Greg KD6KGW

As the orbit of Oscar 13 continues to decay it is subjected to more and
more radiation. Although the actual predicted date of re-entry is after
the scheduled launch date of P3D, it is very doubtful that it will still
be operational at that time. Whether it will succumb to radiation or
begin to tumble from atmospheric drag and exactly when this might
occur is unknown. I don't know enough about AO-13's orbital characteristics
to hazard a guess as to when things might start to go sour but perhaps
someone more closely involved in AO-13's management might have an idea?

==
John Boudreau VE8EV INTERNET: ve8ev@amsat.org
Inuvik, NWT, CANADA PACKET: VE8EV@KL7GNG.#NAK.AK.USA.NA
==

1250. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-09 09:05:22 UTC
From: ecki@pcmail.nerc-bas.ac.uk
Message-ID: <ecki.11.0009172A@pcmail.nerc-bas.ac.uk>
Source record: 27104
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

In article <oiEbZxa00WB6BAu24y@andrew.cmu.edu> Ergin Guney <eg23+@andrew.cmu.edu> writes:
>From: Ergin Guney <eg23+@andrew.cmu.edu>
>Subject: Re: GPS base stations in Scranton PA area?
>Date: Fri, 5 Aug 1994 13:40:13 -0400

snip
>Either you have been misinformed, or I am missing something big.
snipor a
special land-based factor about GPS signals that I>wasn't aware of (like what
you mean by "differential"),**snip**

>Ergin Guney

Mr Guney, you are missing one of the biggest things about GPS if you have not yet stumbled on differential.

There are several ways of performing differential GPS surveying. The one Mr Brown was referring to involves a receiver at a known point. This computes the difference between the measured satellite ranges and the ranges expected. It can then output these differences in a format called RTCM-102. The corrections are sent to a roving unit by radio or satcom and the corrections applied. This technique overcomes SA and a number of the other error factors in GPS positioning and can therefore deliver accuracies of 1-5m depending on the sophistication of the receivers being used. There are some commercial companies operating differential base stations but one of the biggest such operations is the chain of stations being operated by the US Coast Guard - for details contact the GPS Information Centre - address posted to this newsgroup recently.

Ed King
British Antarctic Survey

1251. Re: DSP Radio Shack

Newsgroup: rec.radio.amateur.space
Date: 1994-08-09 10:12:50 UTC
From: brent@network.ucsd.edu
Message-ID: <327kr2$nmd@network.ucsd.edu>
Source record: 27105

In article <2E466083@msmail.uthscsa.edu> MUENZLERK@uthscsa.EDU (Muenzler, Kevin) writes:
>
>>Ken Durham (ken@fstop.csc.ti.com) wrote:
>the fact that it has no real noise filter in it. I think it states
>that it has a 20db noise reduction. BULL!!! It has NO noise filter!

If you are looking for a digital filter that actually reduces broadband noise, I would highly recommend the JPS NRU-500. The advertised reduction is 20 db, which is measurable, and there is a very good vox circuit which does a job at distinguishing between noise and voice. The heterodyne reduction is also good. There are plenty of outputs on the back for audio equipment, tape recorders, etc., including VOX relay outputs.

Brent Jones
Amundsen-Scott South Pole Station
90 Degrees South Latitude
Antarctica

1252. Re: GPS base stations in Scranton PA area?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-09 12:41:44 UTC
From: igb@fulcrum.co.uk
Message-ID: <Cu9pxK.57x@fulcrum.co.uk>
Source record: 27103
Cross-posted to: rec.radio.amateur.space,sci.geo.satellite-nav

In article <1994Aug6.151404.24486@ke4zv.atl.ga.us>,
Gary Coffman <gary@ke4zv.atl.ga.us> wrote:
> such as offshore drill rigs. And it's obviously necessary for land

I spent an idle hour in the residents' bar at the PYG chatting to a guy from an oil company, who was doing fascinating propagation studies to run D-GPS over wide areas. They're serious, to put it mildly, about precision.

ian

1253. Hello

Newsgroup: rec.radio.amateur.space
Date: 1994-08-09 18:49:00 UTC
From: peer.casillo@woodybbs.com
Message-ID: <93.894.7587.0NFB2D4F@woodybbs.com>
Source record: 27106

```
*@ORIGIN :Cosimo DelRosso@DXCON.COM N
Hi, I'm just TESTing to see if this will work.!?
Nereis

--- QScan v1.10b / 01-0220
* Origin: (1:107/593)
```

1254. orbs$210.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-09 21:48:52 UTC
From: Peter Huber <Peter.Huber@f747.n115.z1.fidonet.org>
Message-ID: <776468932@f747.n115.z1>
Source record: 26951

A
+++0
Q}

1255. Two-Line Orbital Element Sets (TLE445)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-10 03:30:36 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.776489436@afit.af.mil>
Source record: 27108

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #445 -
Alouette 1
1 00424U 62049 94217.57514754 .00000025 00000-0 18683-4 0 169
2 00424 80.4629 236.2725 0023273 351.5811 8.4940 13.67815737589150
ATS 1
1 02608U 66110A 94221.23085142 -.00000306 00000-0 10000-3 0 8941
2 02608 14.5797 359.8963 0010098 47.6408 300.0078 1.00358263 17993
ATS 3
1 03029U 67111A 94218.86066564 -.00000114 00000-0 10000-3 0 2281
2 03029 14.6854 6.9841 0009798 266.8580 245.9401 1.00273082 97947
Cosmos 398
1 04966U 71016A 94220.84955435 .00102934 73651-5 19525-3 0 4200
2 04966 51.4420 121.2703 0978862 161.6649 202.2833 13.99475855780092
Starlette
1 07646U 75010A 94217.75018567 -.00000139 00000-0 42682-5 0 8033
2 07646 49.8247 317.7742 0206054 139.9921 221.6324 13.82186459984706
LAGEOS
1 08820U 76039A 94217.74489661 -.00000008 00000-0 10000-3 0 175
2 08820 109.8190 152.5708 0044322 274.7634 84.7903 6.38664533170311
ETS-2
1 09852U 77014A 94219.48934716 -.00000296 00000-0 10000-3 0 9756
2 09852 12.2413 40.9026 0003241 64.4033 333.2913 1.00011018 10849
GOES 2
1 10061U 77048A 94220.27059584 .00000069 00000-0 00000+0 0 3797
2 10061 11.2933 45.0813 0001522 16.6642 216.6925 1.00285913 7631
IUE
1 10637U 78012A 94219.30075102 -.00000249 00000-0 10000-3 0 247
2 10637 34.6876 94.0800 1317527 37.4839 240.9110 1.00251896 13232
GPS BI-01
1 10684U 78020A 94220.74255890 .00000002 00000-0 10000-3 0 2891
2 10684 64.6756 43.9524 0062415 163.6827 196.5634 1.98069650105973
```

```
GPS BI-02
1 10893U 78047A 94219.33791864 .00000022 00000-0 10000-3 0 880
2 10893 63.5065 282.7841 0215743 13.8651 346.8384 2.01627634119105
GOES 3
1 10953U 78062A 94219.51666134 .00000050 00000-0 10000-3 0 3441
2 10953 10.2296 47.8729 0005933 69.0630 207.5982 1.00258024 12234
SeaSat 1
1 10967U 78064A 94217.85922906 -.00000067 00000-0 22537-4 0 3128
2 10967 107.9964 205.0049 0002365 244.6023 115.4873 14.37970384843503
GPS BI-03
1 11054U 78093A 94213.20715458 -.00000017 00000-0 10000-3 0 2052
2 11054 63.2205 280.4196 0044706 178.2524 181.8412 1.93505553115380
Nimbus 7
1 11080U 78098A 94217.69752763 -.00000060 00000-0 -16382-4 0 4166
2 11080 99.0477 99.4637 0009430 4.0490 356.0737 13.83728577796924
GPS BI-04
1 11141U 78112A 94206.72424486 -.00000047 00000-0 00000+0 0 9008
2 11141 64.6438 45.6574 0048759 26.6362 333.6854 1.92894367 4522
GPS BI-05
1 11690U 80011A 94217.77311173 .00000013 00000-0 10000-3 0 8166
2 11690 65.0551 45.8002 0142532 197.1880 162.3910 2.00557805120536
GPS BI-06
1 11783U 80032A 94216.16350318 .00000022 00000-0 10000-3 0 9912
2 11783 62.6269 276.6117 0210676 29.1968 332.0664 2.03456697104933
GOES 5
1 12472U 81049A 94217.62399378 -.00000010 00000-0 10000-3 0 7802
2 12472 6.9243 57.4579 0006907 18.8606 341.4342 1.00333274 6268
Cosmos 1383
1 13301U 82066A 94217.54489404 .00000024 00000-0 11496-4 0 3143
2 13301 82.9306 273.5668 0027136 322.2895 37.6355 13.68057066604174
LandSat 4
1 13367U 82072A 94218.73961758 .00000006 00000-0 11287-4 0 5174
2 13367 98.1752 276.3595 0008146 95.0209 265.1916 14.57123355641428
IRAS
1 13777U 83004A 94221.04574088 .00000187 00000-0 15891-3 0 6758
2 13777 98.9713 50.8962 0011882 164.7238 195.4280 13.99216867258539
Cosmos 1447
1 13916U 83021A 94219.37648389 .00000026 00000-0 12107-4 0 4164
2 13916 82.9457 333.8329 0036325 246.4624 113.2710 13.74312453570364
TDRS 1
1 13969U 83026B 94218.71483359 -.00000198 00000-0 10000-3 0 3246
2 13969 7.7982 50.5700 0007673 84.6132 162.4217 1.00269622 14553
GOES 6
1 14050U 83041A 94220.57784081 .00000019 00000-0 10000-3 0 2451
2 14050 5.7133 60.4246 0004479 6.1531 335.0682 1.00229176 13305
OSCAR 10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
LandSat 5
1 14780U 84021A 94220.08162918 .00000000 00000-0 10000-4 0 1107
```

```
2 14780 98.1578 278.8032 0006044 98.0804 262.1080 14.57135988555031
UoSat 2
1 14781U 84021B 94217.06002530 .00000040 00000-0 14575-4 0 7140
2 14781 97.7858 229.4962 0012777 110.4929 249.7644 14.69234472557488
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94217.02156065 .00000024 00000-0 92267-5 0 6156
2 15055 82.9522 29.0282 0029126 79.9344 280.5098 13.73608522507332
GPS BI-10
1 15271U 84097A 94220.99143067 .00000026 00000-0 10000-3 0 8340
2 15271 62.3361 276.5594 0147139 349.2180 10.5655 2.00584476 71667
Cosmos 1602
1 15331U 84105A 94217.98669821 .00000227 00000-0 23976-4 0 3078
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2 22275 54.6513 194.4250 0058725 250.4088 108.9453 2.00565860 11951
TDRS 5
1 22314U 93003B 94214.51523148 -.00000283 00000-0 10000-3 0 4225
2 22314 1.2053 72.8695 0001937 31.4601 345.6405 1.00259507 5727
GPS BIIA-18
1 22446U 93007A 94219.23383156 -.00000053 00000-0 00000+0 0 4288
2 22446 54.6296 315.2142 0074064 345.3583 14.4652 2.00567891 10924
Glonass 59
1 22512U 93010A 94218.33781518 .00000018 00000-0 00000+0 0 6125
2 22512 64.9282 107.2536 0008696 196.8736 163.1708 2.13102226 11184
Glonass 60
1 22513U 93010B 94219.68565904 .00000027 00000-0 00000+0 0 6258
2 22513 64.9192 107.2197 0006555 193.1576 166.9046 2.13103058 11407
Glonass 61
1 22514U 93010C 94217.10643502 .00000006 00000-0 00000+0 0 6083
2 22514 64.9274 107.2959 0013299 191.4104 168.6258 2.13101678 11350
ASTRO-D
1 22521U 93011A 94217.89311191 .00000395 00000-0 26980-4 0 3149
2 22521 31.1046 123.7419 0076265 218.8471 140.6657 14.93285839 79538
UFO F1
1 22563U 93015A 94218.78496677 .00000024 00000-0 10000-3 0 3134
2 22563 26.5592 299.0363 0003456 226.8604 151.9635 0.99247407 9345
GPS BIIA-19
1 22581U 93017A 94218.87656665 -.00000054 00000-0 10000-3 0 3258
2 22581 55.1360 15.5280 0049042 36.3642 323.9825 2.00563787 9979
ARSENE
1 22654U 93031B 94205.08601395 -.00000142 00000-0 00000+0 0 2672
2 22654 1.9520 97.7392 2917162 186.8922 167.2050 1.42201946 1729
GPS BIIA-20
1 22657U 93032A 94214.03053022 -.00000060 00000-0 00000+0 0 3376
2 22657 55.1722 15.5387 0065057 206.7660 152.9191 2.00554144 5205
RADCAL
1 22698U 93041A 94217.75960958 .00000046 00000-0 14280-4 0 3191
2 22698 89.5503 306.8639 0093500 26.7468 333.8501 14.21316493 57632
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GPS BIIA-21
1 22700U 93042A 94217.48392192 .00000048 00000-0 00000+0 0 3175
2 22700 54.4904 256.1806 0029592 322.4196 37.4647 2.00555485 8071
NOAA 13
1 22739U 93050A 94220.83629728 -.00000034 00000-0 59265-5 0 5268
2 22739 98.9477 165.0212 0010225 338.3427 21.7311 14.10902847 51395
GPS BIIA-22
1 22779U 93054A 94219.56158204 -.00000051 00000-0 10000-3 0 3562
2 22779 54.7735 315.1520 0023320 231.6556 128.1837 2.00578033 6874
Meteor 2-21
1 22782U 93055A 94217.85282932 .00000047 00000-0 28853-4 0 3237
2 22782 82.5489 167.0796 0024104 85.2658 275.1250 13.83011571 46956
UFO F2
1 22787U 93056A 94218.78811806 -.00000063 00000-0 00000+0 0 3018
2 22787 4.7915 323.6199 0003310 136.6195 210.0532 1.00275694 3599
SPOT 3
1 22823U 93061A 94217.82622179 -.00000014 00000-0 13990-4 0 3330
2 22823 98.7113 291.5524 0001404 53.6456 306.4845 14.20035156 44537
STELLA
1 22824U 93061B 94218.67107408 -.00000050 00000-0 -26985-5 0 3114
2 22824 98.6527 293.8290 0007347 60.1774 300.0150 14.27097479 44878
AO-27
1 22825U 93061C 94218.20757382 -.00000025 00000-0 75865-5 0 3118
2 22825 98.6513 293.5078 0009619 62.7450 297.4711 14.27630597 44829
IO-26
1 22826U 93061D 94218.74557302 -.00000007 00000-0 15122-4 0 3117
2 22826 98.6511 294.0850 0010155 63.7174 296.5049 14.27735455 44905
HEATHSAT
1 22827U 93061E 94218.23172459 .00000005 00000-0 19583-4 0 3738
2 22827 98.6494 293.5428 0010140 53.1447 307.0659 14.27847435 44830
ITAMSAT
1 22828U 93061F 94218.18371130 .00000007 00000-0 20487-4 0 2893
2 22828 98.6463 293.5448 0011223 49.3829 310.8324 14.28062056 12917
PO-28
1 22829U 93061G 94218.19016610 .00000007 00000-0 20563-4 0 3047
2 22829 98.6466 293.5646 0011060 52.1754 308.0431 14.28035627 44837
KO-25
1 22830U 93061H 94218.18413095 -.00000061 00000-0 -73176-5 0 3160
2 22830 98.5513 290.2453 0012359 33.3635 326.8318 14.28060392 44831
GPS BIIA-23
1 22877U 93068A 94218.61814026 .00000004 00000-0 10000-3 0 1501
2 22877 55.2260 76.4235 0032882 287.4217 72.3077 2.00572371 5748
METEOSAT 6
1 22912U 93073B 94221.11832975 -.00000083 00000-0 00000+0 0 1142
2 22912 0.7863 266.7946 0002481 245.1866 198.8895 1.00276127 1059
HST Array
1 22920U 90037C 94220.39489587 .00002285 00000-0 17910-3 0 1792
2 22920 28.4705 247.8237 0004446 103.7839 256.3259 14.97266201 37320
Meteor 3-6
1 22969U 94003A 94220.97197317 .00000051 00000-0 10000-3 0 862
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2 22969 82.5560 19.0067 0016200 129.3584 230.8974 13.16723705 25791
TUBSAT-B
1 22970U 94003B 94217.84176424 .00000051 00000-0 10000-3 0 750
2 22970 82.5557 21.1910 0016629 135.0252 225.2218 13.16822546 25388
ODERACS A
1 22990U 94006B 94219.81079762 .00082638 13309-4 18536-3 0 1496
2 22990 56.9818 87.0677 0004122 283.9465 76.2538 15.97848372 28401
ODERACS B
1 22991U 94006C 94220.98939048 .00079463 13081-4 18259-3 0 1399
2 22991 56.9798 82.1177 0004193 298.7899 61.2650 15.97441100 28589
ODERACS E
1 22994U 94006F 94215.80254864 .00019581 00000-0 91214-4 0 1057
2 22994 56.9837 113.1885 0007761 250.2699 109.7538 15.83428103 27655
ODERACS F
1 22995U 94006G 94220.53135586 .00019986 00000-0 91414-4 0 1391
2 22995 56.9841 91.5067 0006498 282.4991 77.5421 15.83814820 28402
BREMSAT
1 22998U 94006H 94217.16147493 .00020255 00000-0 96073-4 0 1183
2 22998 56.9892 108.0665 0003320 302.3959 57.6792 15.83044578 27703
GPS BIIA-24
1 23027U 94016A 94219.69621882 -.00000052 00000-0 00000+0 0 786
2 23027 54.9802 17.4004 0063763 190.6312 169.2445 2.00562814 3076
Glonass 62
1 23043U 94021A 94219.58788628 -.00000052 00000-0 00000+0 0 791
2 23043 64.8081 347.5861 0006993 179.5507 180.4560 2.13102956 2528
Glonass 63
1 23044U 94021B 94220.87854252 -.00000049 00000-0 00000+0 0 621
2 23044 64.8010 347.5384 0030105 201.2276 158.6545 2.13103286 2559
Glonass 64?
1 23045U 94021C 94220.58487450 -.00000049 00000-0 00000+0 0 813
2 23045 64.7905 347.5731 0009523 36.6093 323.4601 2.13100034 2547
GOES 8
1 23051U 94022A 94219.21577326 -.00000189 00000-0 00000+0 0 1480
2 23051 0.3423 265.0762 0002167 290.0476 108.0926 1.00276137 808
STRV-1A
1 23125U 94034B 94217.21158412 .00000462 00000-0 18539-3 0 251
2 23125 6.9710 165.5286 7282799 217.6359 57.1613 2.27321244 1122
STRV-1B
1 23126U 94034C 94219.93906985 .00000107 00000-0 14765-3 0 274
2 23126 6.9599 164.6644 7281539 219.4667 54.1178 2.26917402 1184
Soyuz TM-19
1 23139U 94036A 94220.65098775 .00004954 00000-0 74665-4 0 483
2 23139 51.6466 283.9383 0001205 207.1540 152.8313 15.56754012 5960
PANAMSAT 2
1 23175U 94040A 94220.39940264 .00000113 00000-0 00000+0 0 376
2 23175 0.0267 253.7014 0036721 202.8500 198.7290 1.00266231 347
BS-3N
1 23176U 94040B 94211.86359409 -.00000366 00000-0 00000+0 0 241
2 23176 0.1906 269.5058 0002824 40.0065 71.5583 1.00264808 247
1994040C
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1 23177U 94040C 94217.77126912 .00000051 00000-0 24424-3 0 171
2 23177 7.5943 77.1758 7293216 201.2026 97.7246 2.20415857 591
SPELDA
1 23178U 94040D 94219.37477830 .00020539 00000-0 40176-2 0 206
2 23178 7.0701 76.9734 7277096 202.3091 94.4959 2.29471721 655
NADEZHDA 4
1 23179U 94041A 94217.53314805 .00000029 00000-0 14874-4 0 116
2 23179 82.9449 21.7988 0034940 227.9349 131.8830 13.75656656 3075
1994041B
1 23180U 94041B 94216.99985641 .00000118 00000-0 10411-3 0 198
2 23180 82.9397 22.1523 0026649 223.5131 136.3917 13.77174072 3005
Cosmos 2283
1 23182U 94042A 94219.87016059 .00218948 56776-5 14656-3 0 473
2 23182 67.1035 127.4178 0129360 91.3158 270.2809 16.00779444 2910
APSTAR A1
1 23185U 94043A 94221.23439396 -.00000337 00000-0 00000+0 0 260
2 23185 0.0502 243.6932 0027589 310.3045 340.7116 0.99525023 214
1994043B
1 23186U 94043B 94219.49354173 .00026747 -99951-7 19205-2 0 268
2 23186 26.8352 88.4505 7610335 187.0174 146.9712 1.90749734 331
Cosmos 2284
1 23187U 94044A 94220.44825614 .00057048 38769-5 45672-4 0 275
2 23187 70.3828 103.0473 0048431 8.0218 352.1761 16.11684494 1637
1994044B
1 23188U 94044B 94216.54280634 .08100144 42555-5 11714-3 0 281
2 23188 70.3793 114.1700 0022535 69.7676 290.5781 16.46794418 995
Cosmos 2285
1 23189U 94045A 94220.94530368 .00000077 00000-0 10987-3 0 61
2 23189 74.0304 249.3494 0026356 255.5688 104.2503 13.71650151 846
1994045B
1 23190U 94045B 94220.28275544 -.00003411 00000-0 -36562-2 0 98
2 23190 74.0304 250.4232 0019796 246.5773 113.3489 13.73199662 757
APEX
1 23191U 94046A 94221.17041081 .00000735 00000-0 65276-4 0 119
2 23191 69.9745 234.9286 1393128 151.6766 216.7495 12.52690219 710
DIRECTV
1 23192U 94047A 94220.74947938 -.00000094 00000-0 00000+0 0 83
2 23192 0.1237 327.4255 0781923 338.6497 189.2792 0.98942206 20
1994047B
1 23193U 94047B 94219.65653382 .00026915 00000-0 31579-2 0 42
2 23193 26.8993 130.2995 7478204 180.6988 176.8862 2.05825673 93
1994048A
1 23194U 94048A 94220.54945107 -.00000992 00000-0 10000-3 0 71
2 23194 62.8902 280.4773 7382926 316.2350 5.1120 2.00723567 85
1994048B
1 23195U 94048B 94220.54949630 .00203445 75094-5 45037-3 0 61
2 23195 62.8269 268.2106 0222122 118.6303 243.7354 15.66878620 550
1994048C
1 23196U 94048C 94221.19607250 .00579983 74707-5 51803-3 0 97
2 23196 62.8400 265.8092 0280744 121.1930 241.7047 15.65556952 652
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1994048D
1 23197U 94048D 94218.57243033 -.00000377 00000-0 10000-3 0 36
2 23197 62.8667 280.8027 7357990 316.1812 5.2424 2.03836399 31
1994046B
1 23198U 94046B 94221.17041081 .00000941 00000-0 81976-4 0 53
2 23198 69.9779 234.9324 1393081 151.7477 216.2146 12.52667598 717
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1256. Re: REQ: How to subscribe to AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-10 08:47:31 UTC
From: williams@maui.qualcomm.com
Message-ID: <williams.776508451@maui>
Source record: 27109

dlong@146.230.160.13 (David J Long) writes:
>I need to subscribe to AMSAT for keplerian elements, SpaceNews etc.
>Will appreciate if you will reply via email to dlong@elaine.ee.und.ac.za.

Here's the scoop:

AMSAT.ORG Mailing List and Remailing Services
==========

revised: 7/2/94 kb5mu

AMSAT-NA (the Radio Amateur Satellite Corporation in North America) operates the Internet host AMSAT.ORG to provide for efficient communications between people interested in the amateur satellite program. At this time two services are provided: a message remailing service and a mailing list service.

In the future, an archive of files will be accessible by anonymous ftp or possibly by email. In the meantime, check the host ucsd.edu by anonymous ftp for AMSAT-related files. Consult your local guru for help on using anonymous ftp.

The message remailing service permits users to send each other mail on the Internet without keeping track of each other's Internet address. The remailing service allows each user to receive mail sent to the address callsign@amsat.org, where callsign is that user's amateur radio callsign, or other unique identifier. Mail sent to that address will be routed first to the AMSAT.ORG host at UCSD in San Diego, then remailed from AMSAT.ORG to the network address specified by the user. In most cases, this process delays the message by only a very few minutes.

The mailing list service groups subscribers into mailing lists to receive certain types of messages. There are public mailing lists available to anyone, and private mailing lists available only to certain people (for example, AMSAT Board of Directors members or PACSAT command stations). Currently the following public mailing lists exist:

ANS AMSAT News Service

This mailing list carries official news releases from the AMSAT News Service. These messages are posted in a form suitable for direct posting to a packet radio BBS system. Each message contains a Bulletin Identifier (BID), which permits the message to be introduced into the packet network at many places without resulting in

duplicate bulletins at any BBS. The primary purpose of this mailing list is to distribute ANS bulletins for redistribution (via the packet net or on AMSAT voice nets), but individuals may also subscribe for their own use. If your local packet BBS doesn't seem to get the ANS bulletins reliably, you are encouraged to post the ANS bulletins yourself.

Only authorized AMSAT News Service personnel should send messages to the ANS mailing list.

AMSAT-BB AMSAT bulletin board

This mailing list carries general AMSAT information. This information may NOT be suitable in content for transmission via amateur radio, so automatic reposting of AMSAT-BB messages to packet radio BBS's is discouraged. The purpose of this mailing list is to provide a forum for general discussion of any satellite-related topic.

Anyone may send messages to the AMSAT-BB mailing list. Simply address your message to amsat-bb@amsat.org, and it will be automatically forwarded to all subscribers to the AMSAT-BB mailing list.

Editors of publications should ask permission of the sender before publishing anything seen in AMSAT-BB elsewhere, unless the posting was obviously a public press release. However, posters should realize that anything posted to AMSAT-BB is essentially public.

KEPS Keplerian Elements mailing list

This mailing list carries official postings of Keplerian element sets for satellites of interest to radio amateurs. Like the ANS bulletins, these messages are posted in a form suitable for direct posting to a packet radio BBS.

Only authorized AMSAT News Service personnel should send messages to the KEPS mailing list.

NASAINFO NASA related information mailing list

This mailing list contains information about current and planned NASA space missions. Be forewarned: at times this mailing list delivers many large messages.

SAREX Shuttle Amateur Radio Experiment mailing list

This mailing list contains information and press releases pertaining to SAREX missions.

To obtain any of these services, just send a message to the address

listserv@amsat.org

This address may be reached from CompuServe MAIL as:

>INTERNET:listserv@amsat.org

For the moment, the maintenance of the AMSAT.ORG mailing lists and remailing aliases is done manually. Later, this service will probably be automated and you will have to follow a strict message format. For now, you may send requests in free format. They will usually be processed within a few days. In general, you will not receive an explicit reply to your request. Be sure you specify:

1. Which mailing list(s) you want to receive

2. Your callsign, if any

3. The Internet address to be used, if different from the one in your From: header.

You should not send messages about your subscriptions to any of the mailing lists. Send them to listserv@amsat.org instead. This includes questions, requests for changes, requests for information about mailing services, and complaints.

The list of amateurs who may be reached via the message remailing service may be obtained by requesting the "address book". Note that the address book as distributed contains only the callsigns of the available addressees, not their actual Internet addresses. The address book is updated occasionally, and does not necessarily contain the very latest information.

You may request to be added to the list, to be deleted from the list, or to have your Internet address changed on the list. Please include your callsign if you have one. If you don't have a callsign, that's OK, but please say so. If you have more than one Internet address you want to have available on the AMSAT.ORG remailer, you may so specify. For instance, if you have a regular Internet address and a CompuServe account, you may appear in the address book as both w1xyz and w1xyz-cis. Mail sent to w1xyz would go to your Internet address, and mail sent to w1xyz-cis would go to CompuServe. MCImail accounts have the form w1xyz-mci, and so on.

You may also subscribe or unsubscribe to any of the public mailing lists described above. Send a message to listserv@amsat.org, specifying clearly which mailing list(s) you want to add or drop, and giving your callsign if you have one. When you subscribe to a mailing list, you will automatically be added to the remailing service as well, because the mailing lists are maintained by callsign. If you have more than one address listed in the remailing service, please indicate which one(s) you want the mailing list messages sent to.

Additional mailing lists, public or private, can be set up as needed. Send mail to listserv@amsat.org for details.

Questions about any service offered by AMSAT.ORG may be directed to listserv@amsat.org as well.

Frequently-asked Questions and Complaints (and Answers):

1. Why do I get "MCI Mail Rejected a Message" responses each time I send a message?

MCI won't accept mail from CompuServe via the Internet. This is just corporate policy. There isn't anything we can do about it, short of banning MCImail addresses from the mailing lists.

2. Why did the mailing list messages suddenly stop coming to me a few weeks ago?

Something may have been temporarily wrong with mail delivery to your site. If a message to you bounces back to the list maintainer, you may be removed from the mailing list without notice. If you think this has happened to you, send a message to listserv@amsat.org and ask.

3. I never get an answer from w1xyz when I send him mail via AMSAT.ORG.

If his mail isn't getting delivered, you *should* receive some kind of automatic message indicating there has been a delivery problem. If you don't get such a message within a few days of sending your message, chances are that your message made it to the addressee's mailbox. However, the addressee may be behind on reading email, or may simply not bother to reply, and there isn't much we can do about that.

Another possibility is that the message you sent contains a bad "From:" address. This will prevent the recipient from replying to your message. If you suspect this may be happening, include your real Internet address in the text of the message. If you find that this is happening, please complain to your system administrator.

4. My computer says "unknown host" whenever I try to reach AMSAT.ORG.

This indicates a problem with domain name service. AMSAT.ORG *is* a fully official domain name, and your host should be able to find it. Check with your local network administrator (tell him to check the nameserver at ucsd.edu). As a workaround, you may be able to use an address of the form
callsign%amsat.org@ucsd.edu
to force the message to pass through the UCSD mail host on its way to AMSAT.ORG. If your local system can't find ucsd.edu, you're in trouble!

5. I have an important announcement I'd like to make. Can I send it to the ANS mailing list?

Not unless you're an official ANS station. You may send it to AMSAT-BB, and/or submit it to the ANS editor (wd0hhu@amsat.org) for possible inclusion in the next issue of ANS.

And no, the computer doesn't enforce this rule. You're on your honor.

6. I can't get Internet access!

Yes, you can. It may not be very easy or cheap, but you can. You have a number of alternatives:

* find a local connection. Most hams have inside connections they don't even know about. If you know somebody at the local university or at a high-tech company, ask them if there's any way for you to have access to the Internet through their system. Sometimes the answer will be yes. If you are in a position to grant access, *please* make this service available to local AMSAT folks.

* check with your local BBS. Some telephone BBS systems have access to a mail gateway that will allow you to send and receive Internet mail. This may not be the fastest way to receive the mailing lists, but it is probably the cheapest if you don't have free access.

* subscribe to a pay service. There are several systems that offer Internet access for a fee. CompuServe subscribers can find a list in the Internet library of the TELECOM Forum. AMSAT does not maintain a current list of public Internet providers.

* subscribe to a commercial service that provides Internet access. America Online, Genie, and Delphi are among such services. Check around to find the one with the rate structure that best matches the way you expect to use the system.

* subscribe to CompuServe. Many subscribers to the mailing lists receive their mail via CompuServe. This is an expensive choice, but it is very easy and available in most developed parts of the world. CompuServe is often a local telephone call, and they have an 800 number for people in the less-populated areas of the US. CompuServe starter kits are available at computer stores, and there's often one included free when you buy a modem.

CompuServe users can send mail to Internet addresses by adding
>INTERNET:
before the address. The ">" and the ":" are required, and "INTERNET" must be in uppercase. For example, to send mail to w1xyz, you can use the address
>INTERNET:w1xyz@amsat.org
from CompuServe MAIL. Note that there is no way to communicate between Internet and a CompuServe forum like HamNet. The Internet gateway only works for CompuServe MAIL.

There may be an additional surcharge for receiving messages from the Internet on CompuServe. As a CompuServe subscriber, your mail may also be subject to additional delays. Worse, CompuServe limits the amount of mail you can have pending in your mailbox, so you must read your mail frequently. Check with CompuServe for details.

7. There's too much XYZ being posted to mailing list ABC!

It's not possible for the mailing lists to contain exactly what you find interesting. If we are to share information freely, all subscribers must be prepared to cope with a certain amount of traffic they find boring or useless.

Sometimes it becomes a clear problem, with one subject generating so much traffic that it becomes a burden on a more general mailing list. In those cases, a new mailing list can be created to make it possible for only those who are interested to receive the information. However, there is a practical limit.

8. I posted a message to mailing list ABC, and I got a bunch of bounce messages back.

Most automatically-generated problem report ("bounce") messages should be automatically routed to the list administrator. These messages usually signal a transient problem somewhere in the network. Often, the problem is at the receiving end. If a particular subscriber generates repeated bounce messages, that subscriber will be removed from the mailing lists.

If by some mischance a bounce messages comes back to you, the poster of a message to one of the mailing lists, please forward the bounce message (or a sample if many arrive) to listserv@amsat.org. Please forward the entire message including headers as received. If the echoed text is large, you may edit it down, but preserve all headers and bounce message text.

Do NOT forward bounces resulting from sending messages from CompuServe to MCImail. There's nothing to be done about that.

9. How do I get a password for AMSAT.ORG?

You don't. There are no user accounts on AMSAT.ORG. When you get an alias on AMSAT.ORG, that only allows others to send mail to you as yourcall@amsat.org. It doesn't mean you have an account on AMSAT.ORG.

10. How do I log in to AMSAT.ORG?

You don't. There are no interactive services on AMSAT.ORG.

11. Is there anonymous FTP on AMSAT.ORG?

Not yet.

12. Do I have to be a member of AMSAT to take advantage of the services of AMSAT.ORG?

No, the services are available to anyone. Of course, you're encouraged to join your national AMSAT organization.

13. Is there any charge for AMSAT.ORG services?

No.

1257. Need help with weather satellites

Newsgroup: rec.radio.amateur.space
Date: 1994-08-10 19:21:27 UTC
From: cflarkie@sonalysts.com
Message-ID: <32b9bn$95b@hatch.sonalysts.com>
Source record: 26911

I was wondering if there was anyone out there who could help me with a project that I have been working on. A group that I am working with is researching the location of weather satellites (especially geostationary satellites) and their images. If anyone knows of any directories, files,or even groups that could be helpful please respond. The specific information I will need is:
1. focal length of the camera (in pixels)
2. the aim data for the camera
3. image processing
4. schedule of image transmissions
Thank you for your time and efforts!

cflarkie@sonaltsts.coM

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****
Charles Larkie Sonalysts, Inc.
Email: cflarkie@sonalysts.com 215 Parkway North
Work: (203)442-4355 Waterford CT 06385
****

1258. Perseids on HF

Newsgroup: rec.radio.amateur.space
Date: 1994-08-10 23:23:42 UTC
From: ai@iol.ie
Message-ID: <32bnhu$br9@barnacle.iol.ie>
Source record: 26913

What's the best frequency (and any tips) to hear Perseid meteors on HF receivers?

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David Moore BSc FRAS, Editor of "Astronomy & Space" magazine.
(ai@iol.ie) Chairman, Astronomy Ireland, P.O.Box 2888, Dublin 1.
Tel: +353-1-459 8883. Fax: +353-1-459 9933. Irish News: 1550-111-442
_____U. K. NEWSLINE: 0891-88-1950_____

1259. Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 00:18:22 UTC
From: wmoyes@eis.calstate.edu
Message-ID: <32bqoe$ur@eis.calstate.edu>
Source record: 27110
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

I need information for a homebrew GPS (Global Positioning System). Books, magazines, references, and internet resources would be extremely helpful. I need information on theory, frequencies and modulation, and circuit schematics. Although I would prefer to build my own, any information about commercially available units would be helpful (specifications, sources, and prices), however I will need to hook the output of the device into other equipment. I am also seeking good information on how to set up an experiential differential GPS system.

-William Moyes
wmoyes@eis.calstate.edu
(KC6ARO)

1260. Re: MacSPOC

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 01:31:45 UTC
From: winter@apple.com
Message-ID: <32bv21$j7r@apple.com>
Source record: 26912

In article <321obg$m9r@paperboy.ids.net>, <pchien@ids.net> wrote:
>The key limitation to MacSPOC is that it's so specifically designed
>for use by an astronaut in space (or a payload officer of flight
>dynamic officer on the ground) that it's fairly difficult to use -
>unless you're heavily into the shuttle program.

MacSPOC *is* designed specifically for the space shuttle (it's the Mac version of a program that flies on every mission), but I can't imagine why anyone would consider it difficult to use.

During each mission, Dan sends out checkpoints--the files that hold the current orbital information for the shuttle--as needed, depending on how often the orbit changes significantly during that mission. All you have to do is double-click on a checkpoint file. The program launches and displays the shuttle's orbital tracks. What could be easier?

Dan also sends out the appropriate earth observation lists and other files before each mission; again, you just plunk them into your MacSPOC folder and the program automatically calls them.

The older (now demo) version of MacSPOC is already available on AppleLink (K-12 Education:Education Resources:Science Resources), and it sounds like Terry is working on getting it to some FTP sites. Keep your eyes open for news from Terry and give MacSPOC a try!

Patty
(another satisfied longtime MacSPOC user)

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

1261. Re: Need help with weather satellites

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 09:06:47 UTC
From: kthompso@WichitaKS.NCR.COM
Message-ID: <kthompso.260.00091D46@WichitaKS.NCR.COM>
Source record: 26917

In article <32b9bn$95b@hatch.sonalysts.com> cflarkie@sonalysts.com (Charles Larkie) writes:

>The specific information I will need is:
>1. focal length of the camera (in pixels)

Excuse me but since when is focal length measured in pixels?!

1262. Re: Perseids on HF

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 09:09:58 UTC
From: kthompso@WichitaKS.NCR.COM
Message-ID: <kthompso.261.00092AD0@WichitaKS.NCR.COM>
Source record: 26918

In article <32bnhu$br9@barnacle.iol.ie> ai@iol.ie (Astronomy Ireland) writes:
>From: ai@iol.ie (Astronomy Ireland)
>Subject: Perseids on HF
>Date: 10 Aug 1994 23:23:42 GMT

>What's the best frequency (and any tips) to hear Perseid meteors on HF
>receivers?

Once a year? :-)
With meteors coming in 3 to 4 a minute, meteor scatter work on VHF may be
quite good. I suppose HF would be enhanced as well :-)

1263. STS-65 COMMEMORATIVE TLI BURN

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 12:42:16 UTC
From: lynndel.humphreys@cornucopia.oau.org
Message-ID: <9408110842.A1557wk@cornucopia.oau.org>
Source record: 26915

I would be interested in this file if it can be sent via e-mail.

1264. Re: Sat Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 15:21:02 UTC
From: kohjin@marina.prug.or.jp
Message-ID: <CuDMn3.Jo1@marina.prug.or.jp>
Source record: 26914

In article <hansky.775895990@goya> hansky@mb3.tu-chemnitz.de (Karsten Hansky) writes:
>
>Hello everybody,
>
>an improved version of our tracking program is available now by
>anonymous ftp to:
>
> igel.physik.th-zwickau.de
>
> The filename refers to the date of compilation.
>
>
> Karsten - DL3HRT.
>
> --
> Karsten Hansky (DL3HRT)
> e-mail: hansky@igel.physik.th-zwickau.de
> AX25 : DL3HRT@DB0LPZ.#SAX.DEU.EU
> Phone : +49 0375 536 1429
> --
>

Karsten,

Is it for MSDOS only or Un*x?
What about the source code?
Need more detail information before to try ftp.

73 and thanks, Kohjin

--
----/---- Kohjin Yamada, JR1EDE [kohjin@marina.prug.or.jp]
Q-----T------H 504-55 Shimo-Yamaguchi, Hayama, Miura, Kanagawa, Japan
------/|------- Phone:+81-468-75-6750 Fax/Modem/Voice:+81-468-76-1176

1265. Temperature Telemetry

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 17:18:42 UTC
From: oflber02@uctvax.uct.ac.za
Message-ID: <1994Aug11.191842.1@uctvax.uct.ac.za>
Source record: 26920

I am currently doing a thesis on a Perishable Goods Temperature Monitor.
The thesis calls for a temperature probe which is packed with the goods.
An interrogator then interrogates the probe and a reading is given.
The problem is that the probe is not allowed to have a power source at all.
The interrogator is hand-held and is powered by a battery. An option is
to have a rechargeable set up.
The probe must be as light as possible and as small as possible.
The system must be able to read temperatures between 233K and 313K
with an accuracy of 0.5K
I have thought about using a telemetry system or a transponder.
I have thought about using magnetic, acoustic, RF or microwave coupling
but I do not think I will be able to get enough power from a meter away
to power a IC like the LM35.
The interrogator must be able to receive the temperature from a meter away.
The only thing I have thought of that might work is an oscillating circuit.
The oscillation frequency changes with temperature.
A dip meter is then used as the interrogator.
The only problem is that the only thing I can think of that will vary with
temperature is a bimetallic strip.
The strip can then be used to change the capacitance of the oscillating
circuit.
However I need a circuit for a dip meter which can constantly scan the
frequency range and be able to differentiate the dips so that the required
accuracy is obtained.
Any help or ideas and suggestions are needed and very welcome.
Please send mail to
oflber02@Uctvax.uct.ac.za
Thanks in advance
Bernard O'Flynn
Dept. of Electrical Engineering
University of Cape Town

1266. Where to find Satellite Freqs-Info

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 21:45:55 UTC
From: apple.com
Message-ID: <apple.com-110894144555@goofy-2.apple.com>
Source record: 26919

I am new to this field and have some questions. I would like to know where I can find a listing of all satellites and their frequencies. I have been using Orbitrack to visually locate some satellites but would like to use my scanner to listen in. Eventually, I will upgrade to a ground station. What magazines are best for general satellite info.

Thanks..

1267. Re: Question from a newbie

Newsgroup: rec.radio.amateur.space
Date: 1994-08-11 21:53:53 UTC
From: enigma@SEDS.LPL.Arizona.EDU
Message-ID: <32e6lh$3ab@news.CCIT.Arizona.EDU>
Source record: 26916

Hi there:
I'm new to this so please bear with me. Here's a question that I'm
sure you get quite a lot. Where can I find a list of uplink/downlink
freqs for ALL the amsats? In particular, ones I can download schedule,
and or download images of the Earth from.
Thanks
Andrew Tubbiolo
enigma@seds.lpl.arizona.edu
KC7BHW

1268. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 11:55:58 UTC
From: sol@soleil.serma.cea.fr
Message-ID: <32fo0e$bns@anemone.saclay.cea.fr>
Source record: 26921

Hi William

Try the european "VHF communication" magazine; they are beginning a serie of papers about a homebrew GPS

Hope this will be useful
73 de F1GOC (mike)

1269. orbs$224.oscar.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 14:04:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-224.o.1994@ampr.org>
Source record: 26924
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-224.O
Orbital Elements 224.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX August 12, 1994
BID: $ORBS-224.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94215.22805310
Element set: 295
Inclination: 27.0009 deg
RA of node: 314.8290 deg
Eccentricity: 0.6026240
Arg of perigee: 199.5326 deg
Mean anomaly: 120.6764 deg
Mean motion: 2.05881876 rev/day
Decay rate: -3.02e-06 rev/day^2
Epoch rev: 8375
Checksum: 286

Satellite: UO-11
Catalog number: 14781
Epoch time: 94221.55487948
Element set: 715
Inclination: 97.7855 deg
RA of node: 233.7799 deg
Eccentricity: 0.0012932
Arg of perigee: 97.3098 deg
Mean anomaly: 262.9577 deg
Mean motion: 14.69235369 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 55814
Checksum: 366

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94221.65816035
Element set: 934
Inclination: 82.9261 deg
RA of node: 289.3227 deg
Eccentricity: 0.0010219
Arg of perigee: 234.0018 deg
```

Mean anomaly: 126.0189 deg
Mean motion: 13.72339838 rev/day
Decay rate: 2.0e-07 rev/day^2
Epoch rev: 35724
Checksum: 292

Satellite: AO-13
Catalog number: 19216
Epoch time: 94221.17750886
Element set: 943
Inclination: 57.7592 deg
RA of node: 237.5053 deg
Eccentricity: 0.7223597
Arg of perigee: 347.6665 deg
Mean anomaly: 1.4454 deg
Mean motion: 2.09725165 rev/day
Decay rate: -1.67e-06 rev/day^2
Epoch rev: 4712
Checksum: 325

Satellite: FO-20
Catalog number: 20480
Epoch time: 94222.01015010
Element set: 712
Inclination: 99.0432 deg
RA of node: 3.6784 deg
Eccentricity: 0.0540087
Arg of perigee: 217.4897 deg
Mean anomaly: 138.7382 deg
Mean motion: 12.83227208 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 21103
Checksum: 265

Satellite: AO-21
Catalog number: 21087
Epoch time: 94222.70046281
Element set: 498
Inclination: 82.9449 deg
RA of node: 102.3816 deg
Eccentricity: 0.0034498
Arg of perigee: 294.3271 deg
Mean anomaly: 65.4282 deg
Mean motion: 13.74543405 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 17707
Checksum: 310

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94221.75959325

Element set: 715
Inclination: 82.9244 deg
RA of node: 331.7159 deg
Eccentricity: 0.0028639
Arg of perigee: 322.5180 deg
Mean anomaly: 37.3978 deg
Mean motion: 13.74044430 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 17600
Checksum: 310

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94205.08601395
Element set: 267
Inclination: 1.9520 deg
RA of node: 97.7392 deg
Eccentricity: 0.2917162
Arg of perigee: 186.8922 deg
Mean anomaly: 167.2050 deg
Mean motion: 1.42201946 rev/day
Decay rate: -1.42e-06 rev/day^2
Epoch rev: 172
Checksum: 281

/EX

1270. orbs$224.micro.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 14:07:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-224.d.1994@ampr.org>
Source record: 26925
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-224.D
Orbital Elements 224.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX August 12, 1994
BID: $ORBS-224.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94222.24763648
Element set: 17
Inclination: 98.5890 deg
RA of node: 306.2882 deg
Eccentricity: 0.0011792
Arg of perigee: 35.4805 deg
Mean anomaly: 324.7158 deg
Mean motion: 14.29851303 rev/day
Decay rate: -2.4e-07 rev/day^2
Epoch rev: 23731
Checksum: 301

Satellite: AO-16
Catalog number: 20439
Epoch time: 94222.23120275
Element set: 815
Inclination: 98.5977 deg
RA of node: 307.5625 deg
Eccentricity: 0.0012157
Arg of perigee: 35.7253 deg
Mean anomaly: 324.4741 deg
Mean motion: 14.29905332 rev/day
Decay rate: -2.1e-07 rev/day^2
Epoch rev: 23732
Checksum: 289

Satellite: DO-17
Catalog number: 20440
Epoch time: 94222.25023278
Element set: 816
Inclination: 98.5957 deg
RA of node: 307.9219 deg
Eccentricity: 0.0012143
Arg of perigee: 35.7530 deg
```

Mean anomaly: 324.4461 deg
Mean motion: 14.30045293 rev/day
Decay rate: -1.0e-07 rev/day^2
Epoch rev: 23734
Checksum: 276

Satellite: WO-18
Catalog number: 20441
Epoch time: 94222.22653985
Element set: 818
Inclination: 98.5971 deg
RA of node: 307.8955 deg
Eccentricity: 0.0012821
Arg of perigee: 35.4205 deg
Mean anomaly: 324.7832 deg
Mean motion: 14.30019151 rev/day
Decay rate: -2.3e-07 rev/day^2
Epoch rev: 23734
Checksum: 295

Satellite: LO-19
Catalog number: 20442
Epoch time: 94222.27103683
Element set: 814
Inclination: 98.5968 deg
RA of node: 308.2102 deg
Eccentricity: 0.0013032
Arg of perigee: 34.7336 deg
Mean anomaly: 325.4693 deg
Mean motion: 14.30116074 rev/day
Decay rate: -1.5e-07 rev/day^2
Epoch rev: 23736
Checksum: 278

Satellite: UO-22
Catalog number: 21575
Epoch time: 94222.24097256
Element set: 519
Inclination: 98.4320 deg
RA of node: 295.6386 deg
Eccentricity: 0.0008285
Arg of perigee: 123.7489 deg
Mean anomaly: 236.4486 deg
Mean motion: 14.36926322 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 16084
Checksum: 326

Satellite: KO-23
Catalog number: 22077
Epoch time: 94222.04342604

Element set: 414
Inclination: 66.0789 deg
RA of node: 167.2172 deg
Eccentricity: 0.0015306
Arg of perigee: 274.0291 deg
Mean anomaly: 85.8977 deg
Mean motion: 12.86286862 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9371
Checksum: 311

Satellite: AO-27
Catalog number: 22825
Epoch time: 94222.20247140
Element set: 312
Inclination: 98.6457 deg
RA of node: 297.4572 deg
Eccentricity: 0.0009497
Arg of perigee: 54.1357 deg
Mean anomaly: 306.0723 deg
Mean motion: 14.27630945 rev/day
Decay rate: -3.0e-07 rev/day^2
Epoch rev: 4539
Checksum: 300

Satellite: IO-26
Catalog number: 22826
Epoch time: 94223.23074303
Element set: 312
Inclination: 98.6507 deg
RA of node: 298.5240 deg
Eccentricity: 0.0010070
Arg of perigee: 51.7903 deg
Mean anomaly: 308.4181 deg
Mean motion: 14.27735740 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 4554
Checksum: 278

Satellite: KO-25
Catalog number: 22830
Epoch time: 94222.73835118
Element set: 317
Inclination: 98.5510 deg
RA of node: 294.7043 deg
Eccentricity: 0.0012199
Arg of perigee: 20.8063 deg
Mean anomaly: 339.3611 deg
Mean motion: 14.28060309 rev/day
Decay rate: -5.2e-07 rev/day^2
Epoch rev: 4548

Checksum: 285

Satellite: 22828
Catalog number: 22828
Epoch time: 94222.24746764
Element set: 290
Inclination: 98.6462 deg
RA of node: 297.5675 deg
Eccentricity: 0.0011249
Arg of perigee: 37.9132 deg
Mean anomaly: 322.2837 deg
Mean motion: 14.28062311 rev/day
Decay rate: .00000000 rev/day^2
Epoch rev: 1349
Checksum: 306

/EX

1271. orbs$224.weath.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 14:09:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-224.w.1994@ampr.org>
Source record: 26927
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-224.W
Orbital Elements 224.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX August 12, 1994
BID: $ORBS-224.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94222.74226323
Element set: 909
Inclination: 99.0445 deg
RA of node: 273.8580 deg
Eccentricity: 0.0015931
Arg of perigee: 66.3521 deg
Mean anomaly: 293.9319 deg
Mean motion: 14.13634320 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 49796
Checksum: 317

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94222.78897443
Element set: 804
Inclination: 98.5091 deg
RA of node: 230.1254 deg
Eccentricity: 0.0013136
Arg of perigee: 165.5883 deg
Mean anomaly: 194.5674 deg
Mean motion: 14.24901410 rev/day
Decay rate: 1.5e-07 rev/day^2
Epoch rev: 41027
Checksum: 305

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94223.08226456
Element set: 363
Inclination: 82.5372 deg
RA of node: 224.9119 deg
Eccentricity: 0.0017839
Arg of perigee: 31.5934 deg
```

Mean anomaly: 328.6287 deg
Mean motion: 13.84719652 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 32995
Checksum: 327

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94222.17912864
Element set: 311
Inclination: 82.5420 deg
RA of node: 285.4809 deg
Eccentricity: 0.0018204
Arg of perigee: 125.0761 deg
Mean anomaly: 235.2056 deg
Mean motion: 13.16968112 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29036
Checksum: 281

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94222.80729002
Element set: 727
Inclination: 99.1759 deg
RA of node: 213.0666 deg
Eccentricity: 0.0011965
Arg of perigee: 344.9466 deg
Mean anomaly: 15.1352 deg
Mean motion: 14.13009301 rev/day
Decay rate: 8.4e-07 rev/day^2
Epoch rev: 30285
Checksum: 286

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94222.71816187
Element set: 312
Inclination: 82.5200 deg
RA of node: 100.4553 deg
Eccentricity: 0.0015860
Arg of perigee: 74.2001 deg
Mean anomaly: 286.0902 deg
Mean motion: 13.84370615 rev/day
Decay rate: 6.2e-07 rev/day^2
Epoch rev: 27523
Checksum: 271

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94223.22723154

Element set: 113
Inclination: 82.5459 deg
RA of node: 231.9099 deg
Eccentricity: 0.0006236
Arg of perigee: 156.6699 deg
Mean anomaly: 203.4621 deg
Mean motion: 13.04409787 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23007
Checksum: 284

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94222.22881523
Element set: 815
Inclination: 82.5468 deg
RA of node: 165.5465 deg
Eccentricity: 0.0016799
Arg of perigee: 1.2238 deg
Mean anomaly: 358.8961 deg
Mean motion: 13.84187689 rev/day
Decay rate: -7.5e-07 rev/day^2
Epoch rev: 20809
Checksum: 342

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94222.23678362
Element set: 36
Inclination: 98.8361 deg
RA of node: 240.6534 deg
Eccentricity: 0.0014750
Arg of perigee: 220.8129 deg
Mean anomaly: 139.1913 deg
Mean motion: 14.01347674 rev/day
Decay rate: -2.44e-06 rev/day^2
Epoch rev: 20127
Checksum: 290

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94222.18543781
Element set: 823
Inclination: 82.5269 deg
RA of node: 103.0297 deg
Eccentricity: 0.0011897
Arg of perigee: 259.3809 deg
Mean anomaly: 100.6011 deg
Mean motion: 13.83587375 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 19522

Checksum: 302

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94221.82692081
Element set: 722
Inclination: 82.5439 deg
RA of node: 131.6830 deg
Eccentricity: 0.0014712
Arg of perigee: 52.9382 deg
Mean anomaly: 307.3074 deg
Mean motion: 13.16463881 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15841
Checksum: 280

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94222.77959366
Element set: 131
Inclination: 98.6156 deg
RA of node: 249.3483 deg
Eccentricity: 0.0014043
Arg of perigee: 78.0734 deg
Mean anomaly: 282.2018 deg
Mean motion: 14.22437607 rev/day
Decay rate: 1.55e-06 rev/day^2
Epoch rev: 16826
Checksum: 305

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94220.55930129
Element set: 730
Inclination: 82.5538 deg
RA of node: 79.7645 deg
Eccentricity: 0.0014737
Arg of perigee: 64.0020 deg
Mean anomaly: 296.2620 deg
Mean motion: 13.16833410 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14335
Checksum: 281

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94221.90424291
Element set: 324
Inclination: 82.5499 deg
RA of node: 163.8713 deg
Eccentricity: 0.0024313

```
Arg of perigee: 74.8223 deg
Mean anomaly: 285.5622 deg
Mean motion: 13.83011242 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 4751
Checksum: 280

/EX
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1272. orbs$224.misc.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 14:12:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-224.m.1994@ampr.org>
Source record: 26923
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-224.M
Orbital Elements 224.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX August 12, 1994
BID: $ORBS-224.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94222.67439280
Element set: 305
Inclination: 98.6468 deg
RA of node: 298.0041 deg
Eccentricity: 0.0011062
Arg of perigee: 39.6969 deg
Mean anomaly: 320.5021 deg
Mean motion: 14.28036108 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 4547
Checksum: 287

Satellite: MIR
Catalog number: 16609
Epoch time: 94221.93487962
Element set: 704
Inclination: 51.6487 deg
RA of node: 277.5061 deg
Eccentricity: 0.0001334
Arg of perigee: 205.0665 deg
Mean anomaly: 155.0254 deg
Mean motion: 15.56756678 rev/day
Decay rate: 1.989e-05 rev/day^2
Epoch rev: 48439
Checksum: 334

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94221.91677644
Element set: 516
Inclination: 28.4699 deg
RA of node: 250.8342 deg
Eccentricity: 0.0005776
Arg of perigee: 289.4246 deg
```

Mean anomaly: 70.5718 deg
Mean motion: 14.90651651 rev/day
Decay rate: 2.93e-06 rev/day^2
Epoch rev: 3741
Checksum: 315

Satellite: GRO
Catalog number: 21225
Epoch time: 94222.22017830
Element set: 124
Inclination: 28.4631 deg
RA of node: 216.9834 deg
Eccentricity: 0.0003669
Arg of perigee: 113.1425 deg
Mean anomaly: 246.9566 deg
Mean motion: 15.41125810 rev/day
Decay rate: 1.390e-05 rev/day^2
Epoch rev: 6528
Checksum: 267

Satellite: UARS
Catalog number: 21701
Epoch time: 94223.22221574
Element set: 571
Inclination: 56.9861 deg
RA of node: 298.5128 deg
Eccentricity: 0.0005302
Arg of perigee: 112.2272 deg
Mean anomaly: 247.9264 deg
Mean motion: 14.96568100 rev/day
Decay rate: -2.055e-05 rev/day^2
Epoch rev: 15917
Checksum: 284

/EX

1273. orbs$224.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 14:14:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-224.n.1994@ampr.org>
Source record: 26926
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-224.N
2Line Orbital Elements 224.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX August 12, 1994
BID: $ORBS-224.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 83753
UO-11
1 14781U 84021B 94221.55487948 .00000053 00000-0 16781-4 0 7155
2 14781 97.7855 233.7799 0012932 97.3098 262.9577 14.69235369558146
RS-10/11
1 18129U 87054A 94221.65816035 .00000020 00000-0 54371-5 0 9343
2 18129 82.9261 289.3227 0010219 234.0018 126.0189 13.72339838357240
AO-13
1 19216U 88051B 94221.17750886 -.00000167 00000-0 10000-4 0 9430
2 19216 57.7592 237.5053 7223597 347.6665 1.4454 2.09725165 47122
FO-20
1 20480U 90013C 94222.01015010 -.00000008 00000-0 58905-4 0 7127
2 20480 99.0432 3.6784 0540087 217.4897 138.7382 12.83227208211037
AO-21
1 21087U 91006A 94222.70046281 .00000093 00000-0 82657-4 0 4989
2 21087 82.9449 102.3816 0034498 294.3271 65.4282 13.74543405177078
RS-12/13
1 21089U 91007A 94221.75959325 .00000017 00000-0 21423-5 0 7151
2 21089 82.9244 331.7159 0028639 322.5180 37.3978 13.74044430176000
ARSENE
1 22654U 93031B 94205.08601395 -.00000142 00000-0 00000 0 0 2672
2 22654 1.9520 97.7392 2917162 186.8922 167.2050 1.42201946 1729
UO-14
1 20437U 90005B 94222.24763648 -.00000024 00000-0 77048-5 0 178
2 20437 98.5890 306.2882 0011792 35.4805 324.7158 14.29851303237313
AO-16
1 20439U 90005D 94222.23120275 -.00000021 00000-0 89046-5 0 8156
```

```
2 20439 98.5977 307.5625 0012157 35.7253 324.4741 14.29905332237324
DO-17
1 20440U 90005E 94222.25023278 -.00000010 00000-0 13250-4 0 8167
2 20440 98.5957 307.9219 0012143 35.7530 324.4461 14.30045293237344
WO-18
1 20441U 90005F 94222.22653985 -.00000023 00000-0 81525-5 0 8186
2 20441 98.5971 307.8955 0012821 35.4205 324.7832 14.30019151237345
LO-19
1 20442U 90005G 94222.27103683 -.00000015 00000-0 11086-4 0 8148
2 20442 98.5968 308.2102 0013032 34.7336 325.4693 14.30116074237360
UO-22
1 21575U 91050B 94222.24097256 -.00000008 00000-0 11673-4 0 5198
2 21575 98.4320 295.6386 0008285 123.7489 236.4486 14.36926322160844
KO-23
1 22077U 92052B 94222.04342604 -.00000037 00000-0 10000-3 0 4145
2 22077 66.0789 167.2172 0015306 274.0291 85.8977 12.86286862 93715
AO-27
1 22825U 93061C 94222.20247140 -.00000030 00000-0 55817-5 0 3121
2 22825 98.6457 297.4572 0009497 54.1357 306.0723 14.27630945 45393
IO-26
1 22826U 93061D 94223.23074303 -.00000008 00000-0 14636-4 0 3123
2 22826 98.6507 298.5240 0010070 51.7903 308.4181 14.27735740 45543
KO-25
1 22830U 93061H 94222.73835118 -.00000052 00000-0 -34197-5 0 3171
2 22830 98.5510 294.7043 0012199 20.8063 339.3611 14.28060309 45485
22828
1 22828U 93061F 94222.24746764 .00000000 00000-0 17809-4 0 2903
2 22828 98.6462 297.5675 0011249 37.9132 322.2837 14.28062311 13494
NOAA-9
1 15427U 84123A 94222.74226323 .00000062 00000-0 57159-4 0 9095
2 15427 99.0445 273.8580 0015931 66.3521 293.9319 14.13634320497965
NOAA-10
1 16969U 86073A 94222.78897443 .00000015 00000-0 24755-4 0 8042
2 16969 98.5091 230.1254 0013136 165.5883 194.5674 14.24901410410278
MET-2/17
1 18820U 88005A 94223.08226456 .00000040 00000-0 22417-4 0 3632
2 18820 82.5372 224.9119 0017839 31.5934 328.6287 13.84719652329959
MET-3/2
1 19336U 88064A 94222.17912864 .00000051 00000-0 10000-3 0 3113
2 19336 82.5420 285.4809 0018204 125.0761 235.2056 13.16968112290369
NOAA-11
1 19531U 88089A 94222.80729002 .00000084 00000-0 70222-4 0 7277
2 19531 99.1759 213.0666 0011965 344.9466 15.1352 14.13009301302850
MET-2/18
1 19851U 89018A 94222.71816187 .00000062 00000-0 42045-4 0 3124
2 19851 82.5200 100.4553 0015860 74.2001 286.0902 13.84370615275239
MET-3/3
1 20305U 89086A 94223.22723154 .00000044 00000-0 10000-3 0 1137
2 20305 82.5459 231.9099 0006236 156.6699 203.4621 13.04409787230070
MET-2/19
```

```
1 20670U 90057A 94222.22881523 -.00000075 00000-0 -80117-4 0 8158
2 20670 82.5468 165.5465 0016799 1.2238 358.8961 13.84187689208094
FY-1/2
1 20788U 90081A 94222.23678362 -.00000244 00000-0 -13319-3 0 363
2 20788 98.8361 240.6534 0014750 220.8129 139.1913 14.01347674201273
MET-2/20
1 20826U 90086A 94222.18543781 .00000042 00000-0 24422-4 0 8237
2 20826 82.5269 103.0297 0011897 259.3809 100.6011 13.83587375195224
MET-3/4
1 21232U 91030A 94221.82692081 .00000051 00000-0 10000-3 0 7221
2 21232 82.5439 131.6830 0014712 52.9382 307.3074 13.16463881158413
NOAA-12
1 21263U 91032A 94222.77959366 .00000155 00000-0 88668-4 0 1319
2 21263 98.6156 249.3483 0014043 78.0734 282.2018 14.22437607168267
MET-3/5
1 21655U 91056A 94220.55930129 .00000051 00000-0 10000-3 0 7304
2 21655 82.5538 79.7645 0014737 64.0020 296.2620 13.16833410143357
MET-2/21
1 22782U 93055A 94221.90424291 -.00000006 00000-0 -19428-4 0 3240
2 22782 82.5499 163.8713 0024313 74.8223 285.5622 13.83011242 47510
POSAT
1 22829U 93061G 94222.67439280 .00000014 00000-0 23166-4 0 3058
2 22829 98.6468 298.0041 0011062 39.6969 320.5021 14.28036108 45478
MIR
1 16609U 86017A 94221.93487962 .00001989 00000-0 34044-4 0 7040
2 16609 51.6487 277.5061 0001334 205.0665 155.0254 15.56756678484394
HUBBLE
1 20580U 90037B 94221.91677644 .00000293 00000-0 13954-4 0 5161
2 20580 28.4699 250.8342 0005776 289.4246 70.5718 14.90651651 37410
GRO
1 21225U 91027B 94222.22017830 .00001390 00000-0 26537-4 0 1243
2 21225 28.4631 216.9834 0003669 113.1425 246.9566 15.41125810 65289
UARS
1 21701U 91063B 94223.22221574 -.00002055 00000-0 -15814-3 0 5717
2 21701 56.9861 298.5128 0005302 112.2272 247.9264 14.96568100159177
/EX
```

1274. * SpaceNews 15-Aug-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 15:40:22 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0815.1994@ampr.org>
Source record: 26922
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0815
* SpaceNews 15-Aug-94 *

BID: $SPC0815

=========
SpaceNews
=========

MONDAY AUGUST 15, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* STS-68 LAUNCH DATE SET *
==========
NASA managers have selected August 18 as the official launch date for
Shuttle mission STS-68, the second Space Radar Laboratory flight. Liftoff
is planned for 6:54 AM EDT at the opening of a two hour, 30 minute window.
The mission is scheduled for 10 days, with a planned landing on August 28.

STS-68 will be the seventh flight of orbiter Endeavour, and the 64th mission
of the Space Shuttle program. Commander Mike Baker heads a six person crew
which will operate in two shifts for continuous scientific data gathering
during the mission. Other crew members are pilot Terry Wilcutt, and mission
specialists Steve Smith, Dan Bursch, Jeff Wisoff and Tom Jones who flew on
the first successful SRL mission in April.

Endeavour's primary payload will be the Space Radar Laboratory, part of a
comprehensive effort under NASA's Mission to Planet Earth program, to
understand how the Earth's environment is changing.

[Info via NASA]

* MIR NEWS *
============
The Soyuz-TM20 spacecraft will be launched to the Mir space station on
03-Oct-94 carrying a European cosmonaut who will remain on Mir for 30 days.
The visiting cosmonaut will conduct experiments relating to life sciences
including the monitoring of the human body in microgravity conditions.

The launch of the Progress-M24 cargo vehicle to Mir that was originally
supposed to be launched during the July/August 1994 time frame has been
postponed because of economic reasons. Progress-M24 is now expected to be
launched on 24-Aug-94 and will deliver the normal cargo to the Mir complex
in addition to equipment to be used by the European cosmonaut (Ulf Merbold

or Pedro Duque) during the EuroMir94 mission in October 1994.

[Info via Chris v.d. Berg, NL-9165/A-UK3202]

* DC-X TO BE REPAIRED *
==========
The DC-X launcher has been in limbo since it was damaged in a ground equipment induced explosion. According to Charles "Pete" Conrad, who is with the McDonnel-Douglas test program, the DC-X vehicle is to be returned to California for repairs so that the flight test program can be resumed.

[Info via Andy Reynolds, WD9IYT]

* VE3ONT ADDS 50 MHz EME *
==========
As a result of discussions at the recent meeting of the Central States VHF Society, the Toronto VHF Society (VE3ONT) has added 50 MHz to the list of bands to be used in the upcoming EME contest. 50 MHz will on the air on a non-interference basis simultaneously with 1296 MHz on Sunday of the first EME contest weekend.

VE3ONT will use the 46m (150') dish operated by the Institute for Space and Terrestrial Science at Algonquin Park (FN05xw). On 50 MHz, the antenna will be linearly polarized, and output power will be 1 kW.

UTC Date VE3ONT TX freq listening range approx. times

Oct 29 432.050 MHz 432.050 - 432.060 0645 - 1815 UTC
Oct 30 1296.050 1296.050 - 1296.060 0754 - 1844
Oct 30 50.100 50.100 - 50.105 0754 - 1844

Nov 26 144.100 144.100 - 144.110 0538 - 1645
Nov 27 144.100 144.100 - 144.110 0646 - 1713

Because the Algonquin dish has a 9 degree lower elevation limit, stations with horizon-only antennas in eastern North America will have a limited chance to work VE3ONT. VE3ONT requests that az-el capable stations in Europe and North America delay their QSOs with VE3ONT until after moonrise/moonset windows. This will allow the many horizon-only stations a better chance of making an EME QSO during the limited time available.

Link budget calculations show that 50 MHz stations with 10 dBd (6 elements or so) beams and 1 kW should be able to work VE3ONT off the Moon; smaller stations are urged to try as well.

Use of the dish at the Algonquin Space Complex is always subject to last minute preemption for non-Amateur purposes.

QSLs with an SAE to Dennis Mungham VE3ASO, RR 3, Mountain, Ontario, Canada, K0E1S0. Reception reports are also welcome. Send your log to the ARRL.

For further information contact Peter Shilton VE3VD, (905) 774-8766. Latest developments will be provided at the International EME Conference, Gottskars, Sweden, August 26-28.

[Info via Michael Owen, W9IP]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

NS1Z K5YFW N5XMH KE6FJU KB9DFE Passarello Espedito

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1275. Re: 2 meter CW uplink

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 17:02:16 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Aug12.170216.27920@ke4zv.atl.ga.us>
Source record: 26929

In article <3260es$h9g@hatch.sonalysts.com> gerheim@sonalysts.com (Al Gerheim) writes:
>
>Some authors have recommended using an FM HT for a CW uplink on 2 meters.
>the problem with this is that many HT's take about 200 msec. to generate
>a carrier from the time they are keyed on. This makes the CW uninteligable.
>I also own a 20 watt amp for the HT, and would like to know if there's a way
>to key the amp, or even key the RF going *to* the amp. I feel I'm within
>a few $ of a decent 2 meter uplink, but can't get the pieces together.

A MOPA set. :-)

Sure you can key the amplifier. Key just the PA transistor B+ unless you
like to hear relays clank. You'll have to manually TR. You'll likely need
a click filter in the keying line and a key that can handle 3 or 4 amps.
Old Navy keys with coin silver contacts would be ideal. A multistage amp
would be easier, you could just key the driver rather than the PA and
have to switch less current.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

1276. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 18:54:00 UTC
From: maustin@hollywood.cinenet.net
Message-ID: <32ggg8$hsh@hollywood.cinenet.net>
Source record: 26928
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

William A Moyes (wmoyes@eis.calstate.edu) wrote:
: I need information for a homebrew GPS (Global Positioning
: System). Books, magazines, references, and internet resources
: would be extremely helpful. I need information on theory,
: frequencies and modulation, and circuit schematics. Although I
: would prefer to build my own, any information about commercially
: available units would be helpful (specifications, sources, and
: prices), however I will need to hook the output of the device
: into other equipment. I am also seeking good information on how
: to set up an experiential differential GPS system.

I had an idea. How about linking up a GPS with a cellular phone and
a large battery to power both for a couple of days. Then dial a number
on the cellular where you want the GPS to send it's location info and
drop the whole bundle into someone's car. Since GPS info can be used
with several very cheap street mapping systems (Delorme for one) you'll
be able to sit at home and watch them driving down the street on
your home computer. Should be able to do this cheap. A couple of
hundred dollars (with cheap GPS and cheap phone). I have no ideas
on keeping cellular costs down though. One thought would be to set
the phone to answer and power up the whole gizmo and then shut down
after a call is placed into it. You wouldn't get a continuous
signal but you'd be able to find where someone is on demand (if they're
within cellular calling range). Such a setup could last for a LONG
time with the proper battery.

1277. Galileo SL-9 Impact Image

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 20:47:00 UTC
From: towheed@nssdca.gsfc.nasa.gov
Message-ID: <12AUG199416474174@nssdca.gsfc.nasa.gov>
Source record: 26930

FIRST GALILEO SL-9 "JAILBAR" IMAGE AVAILABLE AT THE NSSDC

The National Space Science Data Center (NSSDC) at NASA's Goddard Space Flight Center is pleased to announces the availability of the latest Comet P/Shoemaker-Levy 9 impact images taken by the Galileo spacecraft.

The images can be obtained using the World Wide Web (WWW) via the URL below.

http://nssdc.gsfc.nasa.gov/sl9/comet_images.html

As of 4:00pm EST, August 12, 1994 we only have the first "Jailbar" image, but we will be providing the full resolution images as soon as they become available.

Syed S. Towheed
Systems Programmer
Hughes STX Corp.

>>>
National Space Science Data Center Phone:(301)286-6695
NASA Goddard Space Flight Center Fax:(301)286-1635
Greenbelt, MD 20771, USA E-mail:request@nssdca.gsfc.nasa.gov

http://www.gsfc.nasa.gov/nssdc/nssdc_home.html
>>>

1278. Two-Line Orbital Element Sets (TLE448)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-12 23:57:02 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.776735822@afit.af.mil>
Source record: 26932

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #448 -
Alouette 1
1 00424U 62049 94222.11027891 .00000031 00000-0 26184-4 0 179
2 00424 80.4626 231.7974 0023079 339.9502 20.0731 13.67816100589775
ATS 1
1 02608U 66110A 94221.23085142 -.00000306 00000-0 10000-3 0 8941
2 02608 14.5797 359.8963 0010098 47.6408 300.0078 1.00358263 17993
ATS 3
1 03029U 67111A 94222.81339408 -.00000119 00000-0 10000-3 0 2297
2 03029 14.6893 6.9424 0009715 266.6220 233.0953 1.00273058 97982
Cosmos 398
1 04966U 71016A 94223.84773843 .00106265 72930-5 20611-3 0 4268
2 04966 51.4446 109.2753 0974899 170.6989 191.3786 14.00152040780517
Starlette
1 07646U 75010A 94222.30505495 -.00000140 00000-0 27689-5 0 8044
2 07646 49.8254 299.7981 0206026 155.0259 206.0771 13.82186494985332
LAGEOS
1 08820U 76039A 94221.81627451 .00000002 00000-0 10000-3 0 183
2 08820 109.8185 153.9638 0044252 273.9820 85.5761 6.38664533170571
ETS-2
1 09852U 77014A 94219.48934716 -.00000296 00000-0 10000-3 0 9756
2 09852 12.2413 40.9026 0003241 64.4033 333.2913 1.00011018 10849
GOES 2
1 10061U 77048A 94222.42082405 .00000065 00000-0 00000+0 0 3813
2 10061 11.2967 45.0550 0001511 17.2220 272.4733 1.00286691 7656
IUE
1 10637U 78012A 94219.30075102 -.00000249 00000-0 10000-3 0 247
2 10637 34.6876 94.0800 1317527 37.4839 240.9110 1.00251896 13232
GPS BI-01
1 10684U 78020A 94220.74255890 .00000002 00000-0 10000-3 0 2891
2 10684 64.6756 43.9524 0062415 163.6827 196.5634 1.98069650105973
```

```
GPS BI-02
1 10893U 78047A 94219.33791864 .00000022 00000-0 10000-3 0 880
2 10893 63.5065 282.7841 0215743 13.8651 346.8384 2.01627634119105
GOES 3
1 10953U 78062A 94223.45916178 .00000044 00000-0 10000-3 0 3460
2 10953 10.2375 47.8218 0005938 69.1524 190.5542 1.00259274 12278
SeaSat 1
1 10967U 78064A 94221.89405729 -.00000046 00000-0 29269-4 0 3133
2 10967 107.9978 213.3546 0002281 240.9209 119.1707 14.37971256844084
GPS BI-03
1 11054U 78093A 94213.20715458 -.00000017 00000-0 10000-3 0 2052
2 11054 63.2205 280.4196 0044706 178.2524 181.8412 1.93505553115380
Nimbus 7
1 11080U 78098A 94222.18058721 -.00000076 00000-0 -30598-4 0 4172
2 11080 99.0471 103.7757 0009134 352.6012 7.5004 13.83728207797547
GPS BI-04
1 11141U 78112A 94222.79516747 -.00000004 00000-0 00000+0 0 9031
2 11141 64.7023 45.2143 0047762 25.9153 334.3619 1.92884407 4839
GPS BI-05
1 11690U 80011A 94223.75635565 -.00000004 00000-0 10000-3 0 8188
2 11690 65.0572 45.6212 0142738 197.2055 162.3296 2.00558184120654
GPS BI-06
1 11783U 80032A 94216.16350318 .00000022 00000-0 10000-3 0 9912
2 11783 62.6269 276.6117 0210676 29.1968 332.0664 2.03456697104933
GOES 5
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2 22012 81.6723 113.9208 0117868 222.8949 136.3028 14.91031178114326
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1 22014U 92039A 94221.36051689 .00000051 00000-0 00000+0 0 4314
2 22014 54.8782 195.6211 0086166 302.2891 56.8493 2.00560364 8810
Glonass 56
1 22056U 92047A 94223.28323155 -.00000047 00000-0 00000+0 0 9144
2 22056 64.9272 346.9958 0004286 257.1392 102.8216 2.13103135 15780
Glonass 57
1 22057U 92047B 94223.57761887 -.00000047 00000-0 00000+0 0 9189
2 22057 64.9369 347.0054 0006401 318.5242 41.4396 2.13102015 15765
Glonass 58
1 22058U 92047C 94222.57973457 -.00000046 00000-0 00000+0 0 9287
2 22058 64.9341 347.0491 0008936 270.3797 89.5318 2.13102898 15795
TOPEX
1 22076U 92052A 94222.22413013 -.00000038 00000-0 10000-3 0 7905
2 22076 66.0411 178.7601 0007496 264.4667 95.5493 12.80931222 93410
KO-23
1 22077U 92052B 94222.04342604 -.00000037 00000-0 10000-3 0 4145
2 22077 66.0789 167.2172 0015306 274.0291 85.8977 12.86286862 93715
S80/T
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1 22078U 92052C 94222.27276245 -.00000037 00000-0 10000-3 0 4115
2 22078 66.0773 165.9628 0016757 274.6735 85.2366 12.86569205 93812
GPS BIIA-15
1 22108U 92058A 94223.82267849 .00000032 00000-0 10000-3 0 4357
2 22108 54.3107 255.1980 0107811 141.8574 218.9761 2.00557449 14042
FREJA
1 22161U 92064A 94221.25514863 -.00000150 00000-0 -18997-4 0 4266
2 22161 63.0039 158.4143 0787488 319.8056 34.7580 13.21770901 88818
LAGEOS II
1 22195U 92070B 94221.27023330 -.00000009 00000-0 10000-3 0 3173
2 22195 52.6584 60.1267 0138596 140.2618 220.8194 6.47293882 42389
GPS BIIA-16
1 22231U 92079A 94222.51500146 .00000058 00000-0 00000+0 0 4276
2 22231 54.7314 196.7915 0038263 289.0914 70.4646 2.00553627 12593
GPS BIIA-17
1 22275U 92089A 94223.15198549 .00000060 00000-0 00000+0 0 4482
2 22275 54.6544 194.3006 0059315 246.9477 112.4118 2.00566052 12011
TDRS 5
1 22314U 93003B 94220.06172454 -.00000286 00000-0 10000-3 0 4236
2 22314 1.2088 72.9156 0002248 216.1541 3.2311 1.00279794 5777
GPS BIIA-18
1 22446U 93007A 94224.21957479 -.00000062 00000-0 00000+0 0 4300
2 22446 54.6292 315.0093 0073551 346.2387 13.6154 2.00567628 11023
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1 22512U 93010A 94222.09191191 .00000024 00000-0 00000+0 0 6133
2 22512 64.9323 107.1216 0008648 194.8453 165.2124 2.13102265 11262
Glonass 60
1 22513U 93010B 94223.90898806 .00000007 00000-0 00000+0 0 6267
2 22513 64.9227 107.0762 0006689 192.8201 167.2427 2.13102728 11490
Glonass 61
1 22514U 93010C 94221.32981493 .00000028 00000-0 00000+0 0 6091
2 22514 64.9334 107.1535 0013178 190.3562 169.7007 2.13101717 11446
ASTRO-D
1 22521U 93011A 94222.03743651 .00000300 00000-0 18562-4 0 3155
2 22521 31.1048 97.7097 0076407 259.0861 100.1180 14.93287075 80156
UFO F1
1 22563U 93015A 94218.78496677 .00000024 00000-0 10000-3 0 3134
2 22563 26.5592 299.0363 0003456 226.8604 151.9635 0.99247407 9345
GPS BIIA-19
1 22581U 93017A 94218.87656665 -.00000054 00000-0 10000-3 0 3258
2 22581 55.1360 15.5280 0049042 36.3642 323.9825 2.00563787 9979
ARSENE
1 22654U 93031B 94205.08601395 -.00000142 00000-0 00000+0 0 2672
2 22654 1.9520 97.7392 2917162 186.8922 167.2050 1.42201946 1729
GPS BIIA-20
1 22657U 93032A 94222.00824281 -.00000054 00000-0 00000+0 0 3402
2 22657 55.1709 15.2215 0066373 207.0948 152.5705 2.00552934 5361
RADCAL
1 22698U 93041A 94222.19489557 .00000035 00000-0 95880-5 0 3202
2 22698 89.5505 306.6382 0093121 12.5878 347.7606 14.21316557 58265
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2 22700 54.4883 256.0176 0029675 321.9530 37.9089 2.00555862 8157
NOAA 13
1 22739U 93050A 94223.81476099 .00000039 00000-0 46924-4 0 5294
2 22739 98.9492 167.9903 0009956 330.0706 29.9895 14.10903737 51811
GPS BIIA-22
1 22779U 93054A 94219.56158204 -.00000051 00000-0 10000-3 0 3562
2 22779 54.7735 315.1520 0023320 231.6556 128.1837 2.00578033 6874
Meteor 2-21
1 22782U 93055A 94221.90424291 -.00000006 00000-0 -19428-4 0 3240
2 22782 82.5499 163.8713 0024313 74.8223 285.5622 13.83011242 47510
UFO F2
1 22787U 93056A 94218.78811806 -.00000063 00000-0 00000+0 0 3018
2 22787 4.7915 323.6199 0003310 136.6195 210.0532 1.00275694 3599
SPOT 3
1 22823U 93061A 94221.84246862 -.00000023 00000-0 99334-5 0 3346
2 22823 98.7110 295.5069 0000909 70.5870 289.5402 14.20035256 45104
STELLA
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2 22824 98.6504 298.2675 0007346 49.1004 311.0814 14.27097674 45519
AO-27
1 22825U 93061C 94222.20247140 -.00000030 00000-0 55817-5 0 3121
2 22825 98.6457 297.4572 0009497 54.1357 306.0723 14.27630945 45393
IO-26
1 22826U 93061D 94223.23074303 -.00000008 00000-0 14636-4 0 3123
2 22826 98.6507 298.5240 0010070 51.7903 308.4181 14.27735740 45543
HEATHSAT
1 22827U 93061E 94222.71654229 -.00000008 00000-0 14419-4 0 3744
2 22827 98.6489 297.9802 0010093 41.4896 318.7036 14.27847784 45479
ITAMSAT
1 22828U 93061F 94222.24746764 .00000000 00000-0 17809-4 0 2903
2 22828 98.6462 297.5675 0011249 37.9132 322.2837 14.28062311 13494
PO-28
1 22829U 93061G 94222.67439280 .00000014 00000-0 23166-4 0 3058
2 22829 98.6468 298.0041 0011062 39.6969 320.5021 14.28036108 45478
KO-25
1 22830U 93061H 94222.73835118 -.00000052 00000-0 -34197-5 0 3171
2 22830 98.5510 294.7043 0012199 20.8063 339.3611 14.28060309 45485
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1 22877U 93068A 94218.61814026 .00000004 00000-0 10000-3 0 1501
2 22877 55.2260 76.4235 0032882 287.4217 72.3077 2.00572371 5748
METEOSAT 6
1 22912U 93073B 94222.91158733 -.00000085 00000-0 00000+0 0 1157
2 22912 0.7817 266.8336 0002524 246.1847 125.2213 1.00276214 1077
HST Array
1 22920U 90037C 94220.39489587 .00002285 00000-0 17910-3 0 1792
2 22920 28.4705 247.8237 0004446 103.7839 256.3259 14.97266201 37320
Meteor 3-6
1 22969U 94003A 94220.97197317 .00000051 00000-0 10000-3 0 862
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2 22969 82.5560 19.0067 0016200 129.3584 230.8974 13.16723705 25791
TUBSAT-B
1 22970U 94003B 94221.86873713 .00000051 00000-0 10000-3 0 763
2 22970 82.5552 18.3482 0016885 125.1490 235.1222 13.16822243 25911
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1 22990U 94006B 94223.68880679 .00104764 15021-4 22342-3 0 1514
2 22990 56.9713 68.9340 0008558 303.3388 56.6903 15.98549210 29025
ODERACS B
1 22991U 94006C 94223.74243869 .00097342 14371-4 21604-3 0 1426
2 22991 56.9808 69.2699 0004870 313.3535 46.8064 15.97927489 29026
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1 22994U 94006F 94223.75642782 .00019336 00000-0 88888-4 0 1073
2 22994 56.9809 76.8175 0007430 285.8497 74.1763 15.83724583 28910
ODERACS F
1 22995U 94006G 94224.00260315 .00020575 00000-0 93377-4 0 1415
2 22995 56.9823 75.6250 0006954 288.3472 71.6854 15.83955080 28954
BREMSAT
1 22998U 94006H 94223.72818382 .00023230 00000-0 10821-3 0 1209
2 22998 56.9870 78.0577 0003719 320.4387 39.6417 15.83333614 28746
GPS BIIA-24
1 23027U 94016A 94219.69621882 -.00000052 00000-0 00000+0 0 786
2 23027 54.9802 17.4004 0063763 190.6312 169.2445 2.00562814 3076
Glonass 62
1 23043U 94021A 94219.58788628 -.00000052 00000-0 00000+0 0 791
2 23043 64.8081 347.5861 0006993 179.5507 180.4560 2.13102956 2528
Glonass 63
1 23044U 94021B 94223.69410531 -.00000048 00000-0 00000+0 0 643
2 23044 64.8113 347.4492 0030210 203.0305 156.8674 2.13115523 2619
Glonass 64?
1 23045U 94021C 94221.99267145 -.00000047 00000-0 00000+0 0 825
2 23045 64.7983 347.5198 0009515 37.6284 322.4534 2.13100982 2573
GOES 8
1 23051U 94022A 94224.23284038 -.00000194 00000-0 00000+0 0 1502
2 23051 0.3307 265.0243 0002139 290.8403 118.5048 1.00275169 850
STRV-1A
1 23125U 94034B 94221.16413665 .00000020 00000-0 89953-4 0 264
2 23125 6.9728 163.9517 7282999 220.7903 51.7250 2.27322122 1215
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1 23126U 94034C 94219.93906985 .00000107 00000-0 14765-3 0 274
2 23126 6.9599 164.6644 7281539 219.4667 54.1178 2.26917402 1184
Soyuz TM-19
1 23139U 94036A 94224.05324233 .00015869 00000-0 22371-3 0 520
2 23139 51.6453 266.9122 0000899 258.6537 101.3361 15.56783051 6499
SPELDA
1 23178U 94040D 94221.11240405 .00018286 00000-0 49098-2 0 216
2 23178 7.1030 76.3749 7270562 203.7175 90.0900 2.29526451 693
NADEZHDA 4
1 23179U 94041A 94221.89717640 .00000013 00000-0 -23863-5 0 128
2 23179 82.9444 18.5624 0034888 215.4477 144.4362 13.75656552 3677
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1 23180U 94041B 94221.50438710 -.00000024 00000-0 -39456-4 0 202
2 23180 82.9398 18.8023 0026882 210.6189 149.3396 13.77173139 3628
Cosmos 2283
1 23182U 94042A 94224.23646767 .00401908 57849-5 19660-3 0 533
2 23182 67.1021 112.7407 0105781 94.9488 266.3796 16.08706114 3614
APSTAR A1
1 23185U 94043A 94222.67255426 -.00000357 00000-0 00000+0 0 328
2 23185 0.0487 247.4606 0016950 46.3755 38.9035 1.00042490 222
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1 23186U 94043B 94221.58399853 .00024423 -64287-6 17010-2 0 281
2 23186 26.8405 87.8663 7609798 188.0169 142.6527 1.90833958 377
Cosmos 2284
1 23187U 94044A 94224.10970858 .00080436 38856-5 62434-4 0 317
2 23187 70.3815 92.3014 0047037 0.0037 0.1175 16.12174402 2225
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1 23188U 94044B 94216.54280634 .08100144 42555-5 11714-3 0 281
2 23188 70.3793 114.1700 0022535 69.7676 290.5781 16.46794418 995
Cosmos 2285
1 23189U 94045A 94222.40395455 .00000033 00000-0 60867-4 0 87
2 23189 74.0300 246.9428 0026372 252.9263 106.8966 13.71649979 1040
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1 23190U 94045B 94223.56075211 .00008033 00000-0 86618-2 0 114
2 23190 74.0266 244.9974 0020327 240.8421 119.0661 13.73314111 1208
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1 23191U 94046A 94222.04877598 .00001192 00000-0 10186-3 0 135
2 23191 69.9719 233.4123 1393255 150.7994 217.8811 12.52694447 822
DIRECTV
1 23192U 94047A 94223.00023872 -.00000112 00000-0 00000+0 0 145
2 23192 0.0300 350.8211 0417669 324.7223 269.0113 0.94050827 128
1994047B
1 23193U 94047B 94221.59282559 .00027023 00000-0 33714-2 0 68
2 23193 26.9211 129.6424 7476338 181.7632 171.9670 2.05929226 137
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1 23194U 94048A 94221.54588086 -.00001009 00000-0 10000-3 0 82
2 23194 62.8968 280.3382 7383474 316.2279 5.0902 2.00711916 106
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1 23195U 94048B 94224.18551285 .00267743 75321-5 55694-3 0 97
2 23195 62.8321 254.5915 0218332 119.2950 243.0200 15.68495861 1129
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1 23196U 94048C 94224.19448540 .00800208 75358-5 71765-3 0 151
2 23196 62.8296 254.5786 0261563 121.5306 241.1766 15.69714257 1122
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1 23197U 94048D 94222.49703049 .00001199 00000-0 10597-1 0 53
2 23197 62.8731 280.2040 7356040 316.2143 5.1391 2.03837290 117
1994046B
1 23198U 94046B 94222.04889102 .00001476 00000-0 12544-3 0 74
2 23198 69.9779 233.4140 1392746 150.8471 217.8090 12.52672227 820
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2 23199 6.3440 120.6910 7050463 179.3980 243.1700 2.23856428 12
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1994049B
1 23200U 94049B 94223.72728324 .00058261 00000-0 79147-2 0 70
2 23200 6.9579 121.3875 7297036 178.5601 258.2181 2.27780854 37
1994049D
1 23202U 94049D 94224.07299280 .00062670 00000-0 79731-2 0 95
2 23202 6.9518 121.0543 7292121 178.9954 184.4643 2.28526864 107
1994050A
1 23203U 94050A 94223.65373949 .00000081 00000-0 10000-3 0 22
2 23203 64.8900 227.2892 0004000 117.1509 242.9131 2.12869752 03
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1 23204U 94050B 94223.65426046 .00000081 00000-0 10000-3 0 19
2 23204 64.8425 226.8581 0013334 295.3894 64.4723 2.13550242 08
1994050C
1 23205U 94050C 94223.65373950 .00000081 00000-0 10000-3 0 26
2 23205 64.8900 227.2892 0004000 117.1509 242.9131 2.12869752 05
1994050D
1 23206U 94050D 94223.82175926 .08824307 77953-5 20801-3 0 62
2 23206 64.8308 226.3368 0015812 284.5786 76.0430 16.44777071 38
1994050E
1 23207U 94050E 94223.88237923 .47560365 76960-5 37048-3 0 56
2 23207 64.8294 226.1208 0004222 316.6284 43.4618 16.52499356 40
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1279. Re: manual needed for ICOM IC-28H

Newsgroup: rec.radio.amateur.space
Date: 1994-08-13 03:10:55 UTC
From: bbsuser@kd3bj.uucp
Message-ID: <CuGE67.KB3@kd3bj.uucp>
Source record: 26931

pchien@ids.net writes:

>Does anybody have a manual for an ICOM IC-28H?

>I just got one at the Jacksonville Hamfest, and need
>to learn how to set it up for the SAREX frequencies.

>Alternately - does anybody have a phone number for ICOM?

>Philip Chien KC4YER
>no sig yet

I have a 28H and the user manual. Send your address via E-mail
(not public posting) and I will copy the manual and send it to you.
If you wish to order from ICOM, call the 800 directory assistance
operator, and ask for their number. It's ICOM America in Bellvue,
Washington.

Bob Garland, NX3S
Robert.Garland @ kd3bj.ampr.org

--
Robert Garland

1280. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-13 08:25:14 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Aug13.082514.868@ke4zv.atl.ga.us>
Source record: 26933
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net (Mark Austin) writes:
>
>I had an idea. How about linking up a GPS with a cellular phone and
>a large battery to power both for a couple of days. Then dial a number
>on the cellular where you want the GPS to send it's location info and
>drop the whole bundle into someone's car. Since GPS info can be used
>with several very cheap street mapping systems (Delorme for one) you'll
>be able to sit at home and watch them driving down the street on
>your home computer. Should be able to do this cheap. A couple of
>hundred dollars (with cheap GPS and cheap phone). I have no ideas
>on keeping cellular costs down though. One thought would be to set
>the phone to answer and power up the whole gizmo and then shut down
>after a call is placed into it. You wouldn't get a continuous
>signal but you'd be able to find where someone is on demand (if they're
>within cellular calling range). Such a setup could last for a LONG
>time with the proper battery.

You aren't going to be able to get a GPS and cell phone for a couple hundred dollars. The cheapest GPS receivers are around $400, and so are cell phones unless you roll their cost into a long term service contract. And monthly and per minute cell phone charges will mount up fairly rapidly. By using packet radio, amateur or commercial, you can send position updates on a regular basis without incurring quite as much cost.

DeLorme Mapping and City Streets are a couple of commercial map systems that work with GPS. However, APRS (Automatic Packet Reporting System) is in some ways better. While it lacks the friendly user interface of the commercial products, and it's pre-made map databases are skimpy, you can make your own maps, and it works with local and remote GPS receivers (using packet UI frames for the latter). It also supports other information about the remote sites such as range and bearing data from DF equipment, and arbitary text messages.

However, what many of us want is *differential* GPS. The Coast Guard, FAA, and others send out position deltas from a fixed benchmark receiver that are received and used to correct the reading of the local GPS receiver. These transmissions are either at MF or VHF depending on the system. A special receiver is required, and either a GPS receiver designed to work with differential signals, or a PC that can take the timestamped position reports and reconcile them via software, is used to give a true position. This method removes the deliberate SA jitter, and other error sources such as varying atmospheric propagation factors,

from the position data. This allows much greater precision in determining location than raw GPS alone.

It would be nice if the APRS author would support this mode in his software. Some of us are willing to set up benchmark receivers on the amateur bands. That timestamped data could be used to correct the positions reported by the rover receivers over packet.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

1281. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-13 16:12:13 UTC
From: gerry@cs.tamu.edu
Message-ID: <32irct$f3u@news.tamu.edu>
Source record: 26934
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

In article <1994Aug13.082514.868@ke4zv.atl.ga.us>,
Gary Coffman <gary@ke4zv.atl.ga.us> wrote:
>In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net (Mark Austin)
writes:
>>
>>I had an idea. How about linking up a GPS with a cellular phone and
>>...
>>signal but you'd be able to find where someone is on demand (if they're
>>within cellular calling range). Such a setup could last for a LONG
>>time with the proper battery.

Everyone should have an idea occasionally... :=)

Well, this is, unfortunately, not a new idea. The similar systems I'm already
familiar with sell for ~$2000, which tells me that they are costing about $1k
for hardware PLUS s/w and R&D.And don't have much markup.

>You aren't going to be able to get a GPS and cell phone for a couple
>hundred dollars. The cheapest GPS receivers are around $400, and so
>are cell phones unless you roll their cost into a long term service
>contract. And monthly and per minute cell phone charges will mount
>up fairly rapidly. By using packet radio, amateur or commercial,
>you can send position updates on a regular basis without incurring
>quite as much cost.

Actually, if you shop carefully, the DGPS without a fancy display costs $318.
Quantity 1. It's a Motorola VP Encore core modure, and it runs on 5 VDC
(regulated), puts out TTL levels, and can receive RTCM-104S differential
updates with Option B installed (for no cost, I might add!). Further, with
Option B, it will put out the differential correction data, acting as a
reference station, albeit in Motorols Proprietary Binary format. The
developers' manual has the full data format, making translation to the
standard format pretty straightforward.

The cellphone could be the hard part, from a cost perspective. I've not
looked into that, because there aren't too many cell sites near the ranch I'm
where I'm putting GPS's on cows.

>DeLorme Mapping and City Streets are a couple of commercial map
>systems that work with GPS. However, APRS (Automatic Packet Reporting
>System) is in some ways better. While it lacks the friendly user
>interface of the commercial products, and it's pre-made map databases
>are skimpy, you can make your own maps, and it works with local and
>remote GPS receivers (using packet UI frames for the latter). It also
>supports other information about the remote sites such as range and

>bearing data from DF equipment, and arbitary text messages.

Very true. In fact, it's seriously impressed the GIS institute here at Texas A&M (Nice Job, Bob!).

>However, what many of us want is *differential* GPS. The Coast Guard,
>FAA, and others send out position deltas from a fixed benchmark
>receiver that are received and used to correct the reading of the local
>GPS receiver. These transmissions are either at MF or VHF depending on
>the system. A special receiver is required, and either a GPS receiver
>designed to work with differential signals, or a PC that can take the
>timestamped position reports and reconcile them via software, is used
>to give a true position. This method removes the deliberate SA jitter,
>and other error sources such as varying atmospheric propagation factors,
>from the position data. This allows much greater precision in determining
>location than raw GPS alone.

Er. Ah. See above. Differential is getting easier and cheaper. A local ham club could go together, get a cheap GPS core, throw together an embedded PC clone for translation, and broadcast the results on packet. Now, if you want to get really fancy, use carrier-phase to get the roaming units a little smoother, AND incorporate DGPS.

>It would be nice if the APRS author would support this mode in his
>software. Some of us are willing to set up benchmark receivers on
>the amateur bands. That timestamped data could be used to correct
>the positions reported by the rover receivers over packet.

And, of course, if you want to, one can log DGPS corrections over a local area and post-process the logged fixes from the mobile units, to give DGPS corrected data. That's one of the standard methods used today. I don't personally think APRS is the appropriate place for DGPS post-processing corrections...

73, gerry
Gerry Creager N5JXS
gerry@cs.tamu.edu
****
Cows In Space: Bovine location services with sub-bovine accuracy.
--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

1282. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-13 20:20:11 UTC
From: btoback@netcom.com
Message-ID: <btobackCuHpto.A1G@netcom.com>
Source record: 26935
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

In article <32irct$f3u@news.tamu.edu> gerry@cs.tamu.edu (Gerald J Creager) writes:
>[Gary Coffman writes]:
>>You aren't going to be able to get a GPS and cell phone for a couple
>>hundred dollars. The cheapest GPS receivers are around $400, and so
>>are cell phones unless you roll their cost into a long term service
>>contract.
>
>Actually, if you shop carefully, the DGPS without a fancy display costs $318.
>Quantity 1. It's a Motorola VP Encore core modure, and it runs on 5 VDC
>(regulated), puts out TTL levels, and can receive RTCM-104S differential
>updates with Option B installed (for no cost, I might add!). Further, with
>Option B, it will put out the differential correction data, acting as a
>reference station, albeit in Motorols Proprietary Binary format. The
>developers' manual has the full data format, making translation to the
>standard format pretty straightforward.

Where can I get more information about this device and the developers'
manual? This sounds very interesting!
>
>The cellphone could be the hard part, from a cost perspective.

In California, various places are selling the bottom-of-the-line Motorola
portable cellphone for $100, with no activation required. (CA has a law
prohibiting anyone from requiring the purchase of cellular service with
a phone. However, you do get a VERY nasty look from the salesperson
when you say "No, I just want the phone.") It's almost getting to the
point where it's worth investigating what it would take to put one of
those phones on the 900 MHz ham band.

Incidentally, one of the earlier posters in this thread mentioned tracking
vehicles using the GPS/cellphone system. We had a demonstration here a
couple of months ago in which a ham put a GPS/APRS system in his wife's
car, and produced the resulting map for the local packet users group. The
map provided an every-two-minutes location for the car for an entire
day.

-- Bruce KN6MN

1283. PERSEIDS ON HF

Newsgroup: rec.radio.amateur.space
Date: 1994-08-14 08:32:00 UTC
From: alan.lyday@aquila.com
Message-ID: <f.691.2582@aquila.com>
Source record: 26937

AI> What's the best frequency (and any tips) to hear Perseid meteors on
AI> receivers?

Hello David, Well during some if not most of the Meteor events here in the States I've used the FM Broadcast band 88-108 Mhz and Tune in stations that are over the Horizon. As for HF Frequencys during the major Meteor Events like the Perseid's Ive also detected Propagation Beacons on the 10 Meter band 28.2-28.3 these are almost always low power simple antennas. With these if the Band is dead You can sometimes hear them Ping out of the Noise for as long as several Minutes. GL.
* RM 1.3 00559 * RoboMail -- The ultimate QWK compatible message manager.

1284. REJECTED: Ham-Space Digest V94 #225

Newsgroup: rec.radio.amateur.space
Date: 1994-08-14 13:26:54 UTC
From: op@dg-rtp.dg.com
Message-ID: <9408141426.AE00034@rtp41.rtp.dg.com>
Source record: 26936

----- Mail rejected by CEO. -----
No Routing Link Available Mail not sent to:gary rogers@dgc.ceo

----- Unsent message follows -----
From: ham-space@UCSD.EDU
To: Ham-Space@UCSD.EDU
Subject: Ham-Space Digest V94 #225
X-Ceo_Options: Document

CEO comments:
See document for message.

CEO document contents:

Ham-Space Digest Sun, 14 Aug 94 Volume 94 : Issue 225

Today's Topics:
2 meter CW uplink
APT-Satellites: Report AUG 07, 1994
Galileo SL-9 Impact Image
Homebrew Global Positioning System (GPS)
Question on AO-21
Where to find Satellite Freqs-Info

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Fri, 12 Aug 1994 17:02:16 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!agate!howland.reston.ans.net!gatech!kd4nc!ke4zv!gary
@network.ucsd.edu
Subject: 2 meter CW uplink
To: ham-space@ucsd.edu

In article <3260es$h9g@hatch.sonalysts.com> gerheim@sonalysts.com (Al Gerheim) writes:
>
>Some authors have recommended using an FM HT for a CW uplink on 2 meters.
>the problem with this is that many HT's take about 200 msec. to generate
>a carrier from the time they are keyed on. This makes the CW uninteligable.

>I also own a 20 watt amp for the HT, and would like to know if there's a way
>to key the amp, or even key the RF going *to* the amp. I feel I'm within
>a few $ of a decent 2 meter uplink, but can't get the pieces together.

A MOPA set. :-)

Sure you can key the amplifier. Key just the PA transistor B+ unless you
like to hear relays clank. You'll have to manually TR. You'll likely need
a click filter in the keying line and a key that can handle 3 or 4 amps.
Old Navy keys with coin silver contacts would be ideal. A multistage amp
would be easier, you could just key the driver rather than the PA and
have to switch less current.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

Date: 8 Aug 1994 07:13:53 GMT
From: lll-winken.llnl.gov!uwm.edu!psuvax1!news.pop.psu.edu!news.cac.psu.edu!newsserver.jvn
c.net!nntp.gmd.de!oskar.gmd.de!user@ames.arpa
Subject: APT-Satellites: Report AUG 07, 1994
To: ham-space@ucsd.edu

Observed at station 50.7 NLat, 7.1 ELon, AUG 07, 1994

NOAA-9: APT 137.62 *OFF*
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 On
NOAA-12: APT 137.50 On
Meteor 3-5: APT 137.85 On

NOAA-9 remains off due to VHF-conflict with NOAA-11.
I did not check for Meteor 2-21, but it should be off
(I had to disconnect the receiver due to thunderstorm).

+--+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+--+

Date: 12 Aug 1994 16:47 EDT
From:
library.ucla.edu!csulb.edu!nic-nac.CSU.net!usc!howland.reston.ans.net!gatech!news-feed-1.p
eachnet.edu!news.duke.edu!eff!cs.umd.edu!newsfeed.gsfc.nasa.gov!nssdca

.gsfc.nasa.@ihnp4.ucsd.edu
Subject: Galileo SL-9 Impact Image
To: ham-space@ucsd.edu

FIRST GALILEO SL-9 "JAILBAR" IMAGE AVAILABLE AT THE NSSDC

The National Space Science Data Center (NSSDC) at NASA's Goddard Space Flight
Center is pleased to announces the availability of the latest Comet
P/Shoemaker-Levy 9 impact images taken by the Galileo spacecraft.

The images can be obtained using the World Wide Web (WWW) via the URL below.

http://nssdc.gsfc.nasa.gov/sl9/comet_images.html

As of 4:00pm EST, August 12, 1994 we only have the first "Jailbar" image, but
we will be providing the full resolution images as soon as they become
available.

Syed S. Towheed
Systems Programmer
Hughes STX Corp.

>>
National Space Science Data Center Phone:(301)286-6695
NASA Goddard Space Flight Center Fax:(301)286-1635
Greenbelt, MD 20771, USA E-mail:request@nssdca.gsfc.nasa.gov

http://www.gsfc.nasa.gov/nssdc/nssdc_home.html
>>

Date: Sat, 13 Aug 1994 08:25:14 GMT
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!swrinde!
emory!rsiatl!ke4zv!gary@network.ucsd.edu
Subject: Homebrew Global Positioning System (GPS)
To: ham-space@ucsd.edu

In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net (Mark Austin)
writes:
>
>I had an idea. How about linking up a GPS with a cellular phone and
>a large battery to power both for a couple of days. Then dial a number
>on the cellular where you want the GPS to send it's location info and
>drop the whole bundle into someone's car. Since GPS info can be used
>with several very cheap street mapping systems (Delorme for one) you'll
>be able to sit at home and watch them driving down the street on
>your home computer. Should be able to do this cheap. A couple of
>hundred dollars (with cheap GPS and cheap phone). I have no ideas
>on keeping cellular costs down though. One thought would be to set
>the phone to answer and power up the whole gizmo and then shut down
>after a call is placed into it. You wouldn't get a continuous
>signal but you'd be able to find where someone is on demand (if they're
>within cellular calling range). Such a setup could last for a LONG

>time with the proper battery.

You aren't going to be able to get a GPS and cell phone for a couple
hundred dollars. The cheapest GPS receivers are around $400, and so
are cell phones unless you roll their cost into a long term service
contract. And monthly and per minute cell phone charges will mount
up fairly rapidly. By using packet radio, amateur or commercial,
you can send position updates on a regular basis without incurring
quite as much cost.

DeLorme Mapping and City Streets are a couple of commercial map
systems that work with GPS. However, APRS (Automatic Packet Reporting
System) is in some ways better. While it lacks the friendly user
interface of the commercial products, and it's pre-made map databases
are skimpy, you can make your own maps, and it works with local and
remote GPS receivers (using packet UI frames for the latter). It also
supports other information about the remote sites such as range and
bearing data from DF equipment, and arbitary text messages.

However, what many of us want is *differential* GPS. The Coast Guard,
FAA, and others send out position deltas from a fixed benchmark
receiver that are received and used to correct the reading of the local
GPS receiver. These transmissions are either at MF or VHF depending on
the system. A special receiver is required, and either a GPS receiver
designed to work with differential signals, or a PC that can take the
timestamped position reports and reconcile them via software, is used
to give a true position. This method removes the deliberate SA jitter,
and other error sources such as varying atmospheric propagation factors,
from the position data. This allows much greater precision in determining
location than raw GPS alone.

It would be nice if the APRS author would support this mode in his
software. Some of us are willing to set up benchmark receivers on
the amateur bands. That timestamped data could be used to correct
the positions reported by the rover receivers over packet.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

Date: Mon, 8 Aug 1994 01:34:35 GMT
From: agate!howland.reston.ans.net!math.ohio-state.edu!magnus.acs.ohio-state.edu!csn!dora!
etuggle@ames.arpa
Subject: Question on AO-21
To: ham-space@ucsd.edu

I'm kinda new to amateur radio and OSCAR. I am interested in using AO-21.
I've been doing some reading about the LEO sats, and most of the information

I've read indicate one should be able to work them with a vertical. I have however, been having a few problems. So, I thought I'd post a question or two.

Is it realistic to expect to work AO-21 with the following setup?

Icom 21WAT (modified to xmit 432-)
20 Watt amp
Dual band "Vent" antenna. (looks like a roof vent pipe)

Let me add I can copy AO-21 VERY well!! My guess is I'll need more than 20 watts. I am thinking about replacing the "Vent" antenna with a J-pole (the one described in the ARRL Handbook). The only problem there is that I would have to mount the antenna in the attic. (I live in a very restrictive area)

Like I said, my guess is I need more power. I hate to go out and buy a big amp if this isn't going to solve the problem however.

Does anyone have any experience working AO-21 with a vertical? If so how much power should I expect it to take? Anyone using the dual band J-Pole from the ARRL handbook inside an attic?

Thanks in advance for any help anyone can offer.

73,
Eddie
KB0LZZ, Parker CO

--
Eddie D. Tuggle, etuggle@dora.auc.trw.com | "There is nothing either good or
TRW Denver Operations | bad, but thinking makes it so."
16201 Centretech Pky / Aurora, CO 80011 | -- SHAKESPEARE
Voice: 303.360.4001 FAX: 303.360.4133 |

Date: Thu, 11 Aug 1994 14:45:55 -0700
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!swrinde!elroy.jpl.nasa.gov!lll-winken.llnl.gov!apple.com!goofy-2.apple.com!user@network.ucsd.edu
Subject: Where to find Satellite Freqs-Info
To: ham-space@ucsd.edu

I am new to this field and have some questions. I would like to know where I can find a listing of all satellites and their frequencies. I have been using Orbitrack to visually locate some satellites but would like to use my scanner to listen in. Eventually, I will upgrade to a ground station. What magazines are best for general satellite info.

Thanks..

Date: 13 Aug 1994 16:12:13 GMT
From: illuminati.io.com!news.tamu.edu!gerry@uunet.uu.net

To: ham-space@ucsd.edu

References <32bqoe$ur@eis.calstate.edu>, <32ggg8$hsh@hollywood.cinenet.net>,
<1994Aug13.082514.868@ke4zv.atl.ga.us>
Subject : Re: Homebrew Global Positioning System (GPS)

In article <1994Aug13.082514.868@ke4zv.atl.ga.us>,
Gary Coffman <gary@ke4zv.atl.ga.us> wrote:
>In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net (Mark Austin)
writes:
>>
>>I had an idea. How about linking up a GPS with a cellular phone and
>>...
>>signal but you'd be able to find where someone is on demand (if they're
>>within cellular calling range). Such a setup could last for a LONG
>>time with the proper battery.

Everyone should have an idea occasionally... :=)

Well, this is, unfortunately, not a new idea. The similar systems I'm already
familiar with sell for ~$2000, which tells me that they are costing about $1k
for hardware PLUS s/w and R&D.And don't have much markup.

>You aren't going to be able to get a GPS and cell phone for a couple
>hundred dollars. The cheapest GPS receivers are around $400, and so
>are cell phones unless you roll their cost into a long term service
>contract. And monthly and per minute cell phone charges will mount
>up fairly rapidly. By using packet radio, amateur or commercial,
>you can send position updates on a regular basis without incurring
>quite as much cost.

Actually, if you shop carefully, the DGPS without a fancy display costs $318.
Quantity 1. It's a Motorola VP Encore core modure, and it runs on 5 VDC
(regulated), puts out TTL levels, and can receive RTCM-104S differential
updates with Option B installed (for no cost, I might add!). Further, with
Option B, it will put out the differential correction data, acting as a
reference station, albeit in Motorols Proprietary Binary format. The
developers' manual has the full data format, making translation to the
standard format pretty straightforward.

The cellphone could be the hard part, from a cost perspective. I've not
looked into that, because there aren't too many cell sites near the ranch I'm
where I'm putting GPS's on cows.

>DeLorme Mapping and City Streets are a couple of commercial map
>systems that work with GPS. However, APRS (Automatic Packet Reporting
>System) is in some ways better. While it lacks the friendly user
>interface of the commercial products, and it's pre-made map databases
>are skimpy, you can make your own maps, and it works with local and
>remote GPS receivers (using packet UI frames for the latter). It also
>supports other information about the remote sites such as range and
>bearing data from DF equipment, and arbitary text messages.

Very true. In fact, it's seriously impressed the GIS institute here at Texas A&M (Nice Job, Bob!).

>However, what many of us want is *differential* GPS. The Coast Guard,
>FAA, and others send out position deltas from a fixed benchmark
>receiver that are received and used to correct the reading of the local
>GPS receiver. These transmissions are either at MF or VHF depending on
>the system. A special receiver is required, and either a GPS receiver
>designed to work with differential signals, or a PC that can take the
>timestamped position reports and reconcile them via software, is used
>to give a true position. This method removes the deliberate SA jitter,
>and other error sources such as varying atmospheric propagation factors,
>from the position data. This allows much greater precision in determining
>location than raw GPS alone.

Er. Ah. See above. Differential is getting easier and cheaper. A local ham club could go together, get a cheap GPS core, throw together an embedded PC clone for translation, and broadcast the results on packet. Now, if you want to get really fancy, use carrier-phase to get the roaming units a little smoother, AND incorporate DGPS.

>It would be nice if the APRS author would support this mode in his
>software. Some of us are willing to set up benchmark receivers on
>the amateur bands. That timestamped data could be used to correct
>the positions reported by the rover receivers over packet.

And, of course, if you want to, one can log DGPS corrections over a local area and post-process the logged fixes from the mobile units, to give DGPS corrected data. That's one of the standard methods used today. I don't personally think APRS is the appropriate place for DGPS post-processing corrections...

73, gerry
Gerry Creager N5JXS
gerry@cs.tamu.edu
****
Cows In Space: Bovine location services with sub-bovine accuracy.
--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

End of Ham-Space Digest V94 #225
****

1285. ANS-225 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-08-14 17:28:10 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-225.01.1994@ampr.org>
Source record: 26938
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-225.01
AMSAT-UK COLLOQUIUM REPORT #1

HR AMSAT NEWS SERVICE BULLETIN 225.01 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 13, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-225.01

AMSAT-UK Colloquium Report: Part 1

AMSAT-UK's annual Colloquium was held at the University of Surrey between 28th to 31st July 1994; over 133 people came from 22 countries in five continents to attend this Colloquium.

The University of Surrey personnel gave several talks about their equipment and the science they are conducting. Noteworthy points about their thinking include: low-cost propulsion (hybrid motors); mini-sats (up to 200 Kg) rather than MICROSATs; higher data rates; use of S-band; GTO, or modified GTO orbits; spread spectrum. One of their approaches to building less expensive satellites was the subject of one paper. It involves the use of commercial grade battery cells. A single space qualified NiCd cell costs about $4000. Surrey buys commercial cells for about $12 each and qualifies them for space use in house, with a resultant cost per cell of less than $1000.

Doug Loughmiller spoke about the S-band beacon on UO-11 which has been switched on for a considerable time; but he has had no reports on it, and appealed for folks to let him know if they hear the beacon, or even if they listened but could not hear it.

Doug also provided an explanation of some of the more obscure codes seen on-screen from UO-22:

F: available space in program memory
L: largest free part of ---''---
TST: transputer status
d: digipeater (0=off)
B: bytes transmitted
Uptime: lifetime of current operations (Days/hours/minutes)
SPIN: 10.1K12G3.2 = 10.1 seconds for one revolution; earth magnetic field model 12; gamma angle (largest offpoint of libration since midnight) 3.2 deg

Ray Soifer W2RS gave a presentation regarding the US Government's intention to "sell" parts of the 2400 MHz band. Concern was expressed by many of the attendees with respect to any such attempt.

James Miller, G3RUH, gave a resume of AO-13's status. He pointed out that, since the proton event of Nay 13th, EDAC counts have been consistently higher than previously. He stressed, however, that AO-13 should continue working up to re-entry. Nevertheless, the effects of drag, once perigee starts to get quite low, are uncertain.

Gerard Auvray, F6FAO, talked about ARSENE which has now been abandoned. He said that the cable between 2M the equipment and antenna was changed just before launch. The suspicion is that a connector was not tightened properly. He also said that there is a new plan, involving a four to five year time-scale, to build a "micro-sat" carrying a Mode l/S linear transponder, this time using the low end of the 2.4 GHz band. A camera may also be incorporated.

A representative from AMSAT-OZ gave a presentation about their replacement for the Kansas City Tracker. The software takes four bits from an IBM PC parallel port and controls the rotors via opto-couplers. It was said that the cost to build is about $20 to $25. The device works on an open loop principle whereby positioning is determined by knowing the time it takes for the rotor to move a specified distance. One can re-calibrate this by moving the rotor to its stop. It was admitted that this approach is not as precise as the Kansas City tracker and similar devices, but it is acceptable for antenna beamwidths greater than
about 20 degrees. The program can also use a tracking table. AMSAT-OZ will be supplying these to AMSAT-UK for international distribution with profits going to AMSAT-UK's Phase-3D fund. AMSAT-UK will make an announce-ment once stocks are to hand.

[The AMSAT News Service would like to thank Richard Limebear (G3RWL) and Ray Soifer (W2RS) for their help in preparing this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-225.02
AMSAT-UK COLLOQUIUM REPORT #2

HR AMSAT NEWS SERVICE BULLETIN 225.02 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 13, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-225.02

AMSAT-UK Colloquium Report: Part 2

Phase-3D papers were presented by Keith Baker KB1SF, Peter Guelzow DB2OS, Karl Meiner DJ4ZC (read by DB2OS), Mike Dorsett G6GEJ and Hans van de Groenendaal ZS5ALE. KB1SF's talk concentrated on the work going on here in the U.S. with emphasis on current progress in getting the spaceframe, now at the Orlando Integration Facility, ready to receive modules. Peter Guelzow's paper dealt with the electronic modules to be included on the satellite, especially the RF equipment.

Future ANS bulletins will carry additional details regarding the Phase 3D subjects presented.

Other Future Spacecraft

Several new satellite projects were announced. One is a non-Amateur spacecraft for the Chilean Air Force called FASAT.

Sias Mostert, ZR1MS, of the University of Stellenbasch, presented a paper on a South African satellite called "SunSat". It measures 45 x 45 x 40 cm and weighs 50 Kg. Current plans call for its launch in January 1996 on a U.S. Air Force Delta mission into eccentric polar orbit measuring 400 by 800 km with a period of 100 minutes. In addition to the usual VHF/UHF (Mode u/v) communications at 1200 and 9600 bps, SunSat is said to have a capability for Mode l/s. The 2401 MHz transmitter is expected to have five watts output and use QPSK modulation and have capability for a 40 Mbps wideband digital downlink intended to transmit video images. It was noted that sufficient bandwidth for experiments such as this is not likely to be available in the 2.4 GHz band if the U.S. NTIA/FCC proposals, currently being discussed, are adopted. The spacecraft will have a conventional power system, reaction-wheel attitude control, and 64 Megabits of RAM for its 80188, 80386 computers and T-800 transputer. The imager payload will consist of a linear array CCD camera producing 8000 pixels in a moving swathe. A resolution of 50 meters per pixel is expected.

[The AMSAT News Service would like to thank Richard Limebear (G3RWL) and Ray Soifer (W2RS) for their help in preparing this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-225.03
AMSAT-UK COLLOQUIUM REPORT #3

HR AMSAT NEWS SERVICE BULLETIN 225.03 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 13, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-225.03

AMSAT-UK Colloquium Report, Part 3: International Satellite Issues

The International Satellite Meeting was chaired by G3AAJ and convened at Thursday evening. A consensus was reached regarding the relationship between the international satellite community and the IARU. This was reflected in a resolution, which reads as follows:

INTERNATIONAL SATELLITE MEETING

INTRODUCTION

The International meeting of the AMSAT Groups hosted by AMSAT-UK at the University of Surrey on 28 July, 1994 expressed concern about the manner in which the services of the IARU Satellite Coordinator were terminated.

It was resolved that:

1. The IARU Administrative Council be urged to create the following positions:

- IARU SATELLITE LIAISON OFFICER

- IARU SATELLITE COORDINATOR

2. The Satellite Coordinator be appointed by the IARU Administrative Council on recommendation of the above mentioned International meeting.

3. The Satellite Liaison officer be appointed by the IARU Administrative Council.

4. The IARU Satellite Coordinator reports to the IARU Satellite Liaison Officer and that he shall be re-imbursed reasonable expenses in accordance with established procedures.

5. It is the express task of the IARU Satellite Coordinator to work closely with AMSAT groups as per terms of reference.

6. The meeting recommends that Freddy de Guchteneire ON6UG be appointed to the position of IARU Satellite Coordinator. Such as appointment to be made by the IARU Administrative Council at the September 1994 meeting.

R.J.C. Broadbent, G3AAJ
Chairman of the International Meeting

It was reported on Friday afternoon that ON6UG, who was not present at the meeting, but he had been contacted by telephone and was in agreement with the meeting's recommendation.

It was decided that, if the satellite's owners agree, POSAT should no longer be referred to as OSCAR 28 since it has been withdrawn from amateur use, but that the number 28 shall be reserved in case POSAT is returned to amateur use in the future.

On Sunday afternoon, Ivan, OZ7IS, chairman of the IARU Region 1 VHF Committee, reported on the Committee's "lengthy discussion" concerning SAREX and MIR. The Committee decided to recommend that, if possible, the downlink be moved to 145.80 and a European voice uplink be introduced at 145.20. The problem is mainly one of terrestrial QRM to the downlink due to the heavy use of 145.55 in Europe for FM simplex operation. The recommendation has been conveyed to the SAREX Working Group.

At the end of the Colloquium the award for the best paper went to James Miller G3RUH (AO-13) and second place went to Leonid Labutin UA3CR (SAREX in Moscow).

This having been the ninth and final Colloquium that Ron Broadbent G3AAJ has organized, Ron was thanked by one and all for his superb performance over the years. Next year's Colloquium, to be organized by Doug Loughmiller G0SYX, will be held 26-29 July 1995.

[The AMSAT News Service would like to thank Richard Limebear (G3RWL) and Ray Soifer (W2RS) for their help in preparing this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-225.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 225.04 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 13, 1994

TO ALL RADIO AMATEURS BT
BID: $ANS-225.04

Weekly OSCAR Status Reports: 13-AUG-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
==========
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
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[G3RUH/DB2OS/VK5AGR]

RS-10: A couple of weeks ago WC9C pointed out that RS-10's 10M downlink signals were sounding quite weak in comparision to a few months about. G3IOR thinks that the problem of weaker distant and stronger distant signals from RS-10 attributed by WC9C to the parent satellites attitude is due more to path attenuation. In the summer we have spread "E" layer levels of far higher intensity. At low angles of incidence, i.e. when the satellite is close to horizon, the path through these attenuating layers is extended, thus producing a much weaker signal, more than can be accounted for by the inverse square rule. When the satellite is close to overhead, the path is minimal, and also far less refraction, reflection and absortion results. RS-10 antenna is close to omni-directional, with only the odd end-on tip effect momentarily reducing the downlink level during it's slow rotation. At night, when the ionization is markedly reduced, signals are nominal. [G3IOR @ GB7VLS]

AO-16: AO-16 is going strong with no problems. [WH6I]

LO-19: LO-19 still seems have its BBS turned off. [WH6I]

IO-27: WH6I still has not heard anything from IO-26 and is afraid that it might stay that way permanently. [WH6I]

AO-16: Still going strong and very doing well. There is some gateway traffic on AO-16 but not enough to present any problem to other users and the file lifetime on the bird is still quite long. [WH6I]

KO-23: Since yesterday KO-23 seems to be down. Yesterday the 9600 baud signal sounded normal, but there was no data on it. Today the signal sounds abnormal. N4NR also reports that KO-23 is in a mode that leaves TNCs and DSPs locked up until a cold reset at the groundstation after the pass is over. Signal strength is good, however. [WH6I & N4NR]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1286. Re: PERSEIDS emitting on HF

Newsgroup: rec.radio.amateur.space
Date: 1994-08-14 19:06:10 UTC
From: ai@iol.ie
Message-ID: <32lpv2$952@barnacle.iol.ie>
Source record: 26939

Alan Lyday (alan.lyday@aquila.com) wrote:
: AI> What's the best frequency (and any tips) to hear Perseid meteors on
: AI> receivers?

: Hello David, Well during some if not most of the Meteor events here in
: the States I've used the FM Broadcast band 88-108 Mhz and Tune in
: stations that are over the Horizon. As for HF Frequencys during the
: major Meteor Events like the Perseid's Ive also detected Propagation
: Beacons on the 10 Meter band 28.2-28.3 these are almost always low power
: simple antennas. With these if the Band is dead You can sometimes hear
: them Ping out of the Noise for as long as several Minutes. GL.
: * RM 1.3 00559 * RoboMail -- The ultimate QWK compatible message manager.

Around 5 or 6 MHz we hear a 1second or shorter duration 'chirp' that we
assume is actually emmision from the meteor track.
Is it something else?
Everyone else seems to be talking about hearing over the horizon stations
rather than picking up emmission direct from meteors.

--
David Moore BSc FRAS, Editor of "Astronomy & Space" magazine.
(ai@iol.ie) Chairman, Astronomy Ireland, P.O.Box 2888, Dublin 1.
Tel: +353-1-459 8883. Fax: +353-1-459 9933. Irish News: 1550-111-442
_____U. K. NEWSLINE: 0891-88-1950_____

1287. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-15 00:54:02 UTC
From: zeus@myth.demon.co.uk
Message-ID: <776912042snz@myth.demon.co.uk>
Source record: 26940
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

In article <32bqoe$ur@eis.calstate.edu>
wmoyes@eis.calstate.edu "William A Moyes" writes:

> I need information for a homebrew GPS (Global Positioning
> System). Books, magazines, references, and internet resources
> would be extremely helpful. I need information on theory,
> frequencies and modulation, and circuit schematics.

Telephone GEC Plessey semiconductors on (408) 438 2900 and ask them about availability of the GP1010 and GP1020 ICs and GP1010 evaluation board. The GP1010 is a receiver on a chip (just add clock and sprinkle lightly with passives) the GP1020 is a correlator that decodes the spread spectrum signal. You will need to design and build your own interface to your development PC of whatever though.

As for information about signal structure etcetera, go to your library and look for anything by J.J.Spilker, issues of GPS world and (unlikely in the US) copies or Electronics World (UK publication) for about 18 months ago. If you can get the annual report from the Institute of Navigation (ION) so much the better. An excellent introduction to GPSs. As for GPS resources, well, there is a GPS UseNet group (can't recall off hand exactly what), but that is mainly uses of GPS and reviews/opinions of particular devices.

Mike.

--

Michael S. Cowgill (Mike) _ My opinions! MINEMINEALLMINEHAHAHAHA!
zeus@myth.demon.co.uk (That's me) _ " Swirly thing alert! "
G1VOX@GB7WRG.GBR.EU 44.131.2.76 _ " ...Cracking toast Gromit!... "

1288. Please Help! I need info on telemetry system!?!?!

Newsgroup: rec.radio.amateur.space
Date: 1994-08-15 05:27:47 UTC
From: LOUXWE96%CS25@cadetmail.usafa.af.mil
Message-ID: <LOUXWE96%CS25.151@cadetmail.usafa.af.mil>
Source record: 26941

Hello,

I am a cadet at the US Air Force Academy and I am doing a research project where we will be launching a hybrid rocket. I am in charge of getting telemetry from this experimental rocket. But, since this is a college project we don't have the cash for expensive telemetry projects.

What I need to know is if the amateur radio community would have a cheeper alternative to this. I need to send info from sensors on the rocket to a ground station and then put the info into a digital form on the computer to analyze it. Is there a way to do this using the technology and equipment in the amateur radio community.

Please any information, suggestions, or a starting point would be greatly appreciated.

thank you,
Bill

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* Cadet William E. Loux | "I have never let my *
* P.O. Box 2835 | schooling interfere *
* United States Air Force Academy | with my education." *
* Email=> louxwe96%cs25@cadetmail.usafa.af.mil | -Mark Twain *
--------"All know the way; Few actually walk it." -Bohhidharma----------

1289. ARLK033 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-08-15 14:03:41 UTC
From: w1aw@arrl.org
Message-ID: <$arlk033.1994@ampr.org>
Source record: 26943
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEP @ ARL $ARLK033
ARLK033 Keplerian data

ZCZC SK01
QST de W1AW
Keplerian Bulletin 33 ARLK033
>From ARRL Headquarters
Newington, CT August 13, 1994
To all radio amateurs

SB KEP ARL ARLK033
ARLK033 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-68
1 99968U 94230.76050690 .00169786 00000-0 85389-4 0 10
2 99968 57.0052 28.8010 0009698 270.9951 89.0013 16.20039161 62
AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
RS-10/11
1 18129U 87054A 94217.28360494 .00000025 00000-0 11516-4 0 9337
2 18129 82.9261 292.5558 0010124 247.8358 112.1720 13.72339818356645
UO-11
1 14781U 84021B 94217.06002530 .00000040 00000-0 14575-4 0 7140
2 14781 97.7858 229.4962 0012777 110.4929 249.7644 14.69234472557488
RS-12/13
1 21089U 91007A 94217.39047551 .00000045 00000-0 32006-4 0 7143
2 21089 82.9224 334.9539 0029126 335.0529 24.9214 13.74044464175408
AO-13
1 19216U 88051B 94217.83984689 .00000387 00000-0 10000-4 0 9420
2 19216 57.7558 238.0897 7222395 347.4623 1.5383 2.09718451 15557
UO-14
1 20437U 90005B 94218.18895812 .00000006 00000-0 19249-4 0 161
2 20437 98.5892 302.2855 0011936 46.0694 314.1470 14.29851355236737
AO-16
1 20439U 90005D 94217.75283107 -.00000015 00000-0 11061-4 0 8144
2 20439 98.5976 303.1403 0012252 47.9314 312.2905 14.29905175236688
```

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DO-17
1 20440U 90005E 94218.19210523 -.00000009 00000-0 13563-4 0 8150
2 20440 98.5990 303.9154 0012353 46.3033 313.9171 14.30044972236763
WO-18
1 20441U 90005F 94217.74852435 -.00000013 00000-0 12029-4 0 8178
2 20441 98.5971 303.4730 0012875 48.1720 312.0554 14.30019028236703
LO-19
1 20442U 90005G 94218.21310999 .00000015 00000-0 22584-4 0 8130
2 20442 98.5997 304.2035 0013244 45.1759 315.0483 14.30116058236782
FO-20
1 20480U 90013C 94217.87774967 -.00000003 00000-0 70241-4 0 7119
2 20480 99.0417 0.3238 0539937 226.8819 128.5911 12.83227042210500
AO-21
1 21087U 91006A 94219.64318363 .00000093 00000-0 82657-4 0 4970
2 21087 82.9451 104.6442 0034599 302.9191 56.8638 13.74543144176652
UO-22
1 21575U 91050B 94218.20224585 .00000014 00000-0 19326-4 0 5184
2 21575 98.4322 291.6827 0008025 134.4659 225.7181 14.36926162160263
KO-23
1 22077U 92052B 94217.92262333 -.00000037 00000-0 10000-3 0 4135
2 22077 66.0796 175.8457 0015291 273.5107 86.4157 12.86286834 93184
KO-25
1 22830U 93061H 94218.18413095 -.00000061 00000-0 -73176-5 0 3160
2 22830 98.5513 290.2453 0012359 33.3635 326.8318 14.28060392 44831
KO-25?
1 22828U 93061F 94218.18371130 .00000007 00000-0 20487-4 0 2893
2 22828 98.6463 293.5448 0011223 49.3829 310.8324 14.28062056 12917
IO-26
1 22826U 93061D 94218.74557302 -.00000007 00000-0 15122-4 0 3117
2 22826 98.6511 294.0850 0010155 63.7174 296.5049 14.27735455 44905
AO-27
1 22825U 93061C 94218.20757382 -.00000025 00000-0 75865-5 0 3118
2 22825 98.6513 293.5078 0009619 62.7450 297.4711 14.27630597 44829
PO-28
1 22829U 93061G 94218.19016610 .00000007 00000-0 20563-4 0 3047
2 22829 98.6466 293.5646 0011060 52.1754 308.0431 14.28035627 44837
Mir
1 16609U 86017A 94221.93487962 .00001989 00000-0 34044-4 0 7040
2 16609 51.6487 277.5061 0001334 205.0665 155.0254 15.56756678484394

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
August 16, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
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1290. Az-El rotor for sale

Newsgroup: rec.radio.amateur.space
Date: 1994-08-15 14:30:33 UTC
From: gregg@plains.nodak.edu
Message-ID: <CuKyyx.DME@ns1.nodak.edu>
Source record: 26942

I have a new, only taken out of the box for inspection, az-el rotator. It is a Dynetic Systems DR10.
New list price from the company in Elk River Mn is $1395! I'd like to get $800 or best offer.
I'll pay shipping. It appears to be a very heavy duty system. It should hold a large, heavy satellite array.
Email for info, specs.

Joe

****
Joseph M. Gregg
Internet: Gregg@Plains.NoDak.edu
Packet: KN0A@W0ILO.#SEND.ND.USA.NOAM
Home: 701-588-4427
Work: 701-237-8353
****

1291. Perseids data for MS-Soft

Newsgroup: rec.radio.amateur.space
Date: 1994-08-16 10:18:41 UTC
From: jsi@vipunen.hut.fi
Message-ID: <32q3q1$964@nntp.hut.fi>
Source record: 26944

Perseids data files available !

Perseids 1994 data files for OH5IY's MS software are available via ftp at
ftp.funet.fi:/pub/ham/vhf-work/msdata94.zip. This file contains currently
only Perseids '94 data, data for all earlier showers is included in v4.2e
which is the latest version of this software (available at same address).
Place the data files as /msdata/per94.b1 and /msdata/per94.m1.

Perseids 1994 as seen from these graphs (measured at 87 MHz):

The first peak occured on Aug 12 at 10-11 UT (max number of bursts at 10 UT,
max total reflection time at 11 UT). The first peak was very good for about
4 hours or so (09-13 UT). MS-Soft v4.2e predicted this peak to be at 1020 UT,
not bad !!! No suprise, the peak was lower than last year.

The second peak occured on Aug 13 at 03 UT. This peak was somewhat lower
than the first one but broader. Good reflections for about 10 hours (01-11 UT).

NOTE: Perseids 1994 data files are not comparable with 1993 files due to
changes in the measurement system on Sept 1, 1993.

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Jukka OH6DD jsi@hut.fi

1292. How to phase two loops for satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-08-16 20:57:23 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <32ra2i$o9@chnews.intel.com>
Source record: 26945
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

I want to homebrew a M2 type eggbeater antenna for the 10 meter RS satellites downlink, however I not quite sure on how to tie them together at the feed point.

The eggbeater antenna is two circular loops at 90 deg to each other, both feed 180 out of phase, into a 50 ohm coax feed. The phase will determine if its right or left hand circularty polorized overhead. I don't want to use 75 or 93 ohm coax delay lines, to bulkey. I would rather use some sort of small L/C circuit what I can mount into a small 1x2 inch box with a SO239 on it. This is for receive only, so RF power handling capabilities is not a concern. I've seen this done at a field day site, however I didn't get the configuration of the box.

Any diagrams, part values or just ideas are welcome.

73s, WB7ASR...

tom_boza@ccm.hf.intel.com

1293. ARLK034 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-08-16 23:28:17 UTC
From: w1aw@arrl.org
Message-ID: <$arlk034.1994@ampr.org>
Source record: 26946
Cross-posted to: rec.radio.info,rec.radio.amateur.space

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SB KEP @ ARL $ARLK034
ARLK034 Keplerian data

ZCZC SK02
QST de W1AW
Keplerian Bulletin 34 ARLK034
From ARRL Headquarters
Newington, CT August 16, 1994
To all radio amateurs

SB KEP ARL ARLK034
ARLK034 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-68
1 99968U 94230.76050690 .00169786 00000-0 85389-4 0 10
2 99968 57.0052 28.8010 0009698 270.9951 89.0013 16.20039161 62
AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
RS-10/11
1 18129U 87054A 94221.65816035 .00000020 00000-0 54371-5 0 9343
2 18129 82.9261 289.3227 0010219 234.0018 126.0189 13.72339838357240
UO-11
1 14781U 84021B 94221.55487948 .00000053 00000-0 16781-4 0 7155
2 14781 97.7855 233.7799 0012932 97.3098 262.9577 14.69235369558146
RS-12/13
1 21089U 91007A 94223.79851575 .00000017 00000-0 25577-5 0 7160
2 21089 82.9243 330.2040 0028499 316.8078 43.0850 13.74044477176282
AO-13
1 19216U 88051B 94223.08468464 -.00000425 00000-0 10000-4 0 9448
2 19216 57.7577 237.1698 7224138 347.7980 1.3807 2.09727529 15660
UO-14
1 20437U 90005B 94222.24763648 -.00000024 00000-0 77048-5 0 178
2 20437 98.5890 306.2882 0011792 35.4805 324.7158 14.29851303237313
AO-16
1 20439U 90005D 94222.23120275 -.00000021 00000-0 89046-5 0 8156
2 20439 98.5977 307.5625 0012157 35.7253 324.4741 14.29905332237324
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DO-17
1 20440U 90005E 94222.25023278 -.00000010 00000-0 13250-4 0 8167
2 20440 98.5957 307.9219 0012143 35.7530 324.4461 14.30045293237344
WO-18
1 20441U 90005F 94222.22653985 -.00000023 00000-0 81525-5 0 8186
2 20441 98.5971 307.8955 0012821 35.4205 324.7832 14.30019151237345
LO-19
1 20442U 90005G 94222.27103683 -.00000015 00000-0 11086-4 0 8148
2 20442 98.5968 308.2102 0013032 34.7336 325.4693 14.30116074237360
FO-20
1 20480U 90013C 94222.01015010 -.00000008 00000-0 58905-4 0 7127
2 20480 99.0432 3.6784 0540087 217.4897 138.7382 12.83227208211037
AO-21
1 21087U 91006A 94222.70046281 .00000093 00000-0 82657-4 0 4989
2 21087 82.9449 102.3816 0034498 294.3271 65.4282 13.74543405177078
UO-22
1 21575U 91050B 94222.24097256 -.00000008 00000-0 11673-4 0 5198
2 21575 98.4320 295.6386 0008285 123.7489 236.4486 14.36926322160844
KO-23
1 22077U 92052B 94222.04342604 -.00000037 00000-0 10000-3 0 4145
2 22077 66.0789 167.2172 0015306 274.0291 85.8977 12.86286862 93715
KO-25
1 22830U 93061H 94222.73835118 -.00000052 00000-0 -34197-5 0 3171
2 22830 98.5510 294.7043 0012199 20.8063 339.3611 14.28060309 45485
KO-25?
1 22828U 93061F 94222.24746764 .00000000 00000-0 17809-4 0 2903
2 22828 98.6462 297.5675 0011249 37.9132 322.2837 14.28062311 13494
IO-26
1 22826U 93061D 94223.23074303 -.00000008 00000-0 14636-4 0 3123
2 22826 98.6507 298.5240 0010070 51.7903 308.4181 14.27735740 45543
AO-27
1 22825U 93061C 94222.20247140 -.00000030 00000-0 55817-5 0 3121
2 22825 98.6457 297.4572 0009497 54.1357 306.0723 14.27630945 45393
PO-28
1 22829U 93061G 94222.67439280 .00000014 00000-0 23166-4 0 3058
2 22829 98.6468 298.0041 0011062 39.6969 320.5021 14.28036108 45478
Mir
1 16609U 86017A 94224.24583970 .00002263 00000-0 37776-4 0 7055
2 16609 51.6468 265.9413 0000936 226.6759 133.4155 15.56767651484758

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Saturday,
August 20, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
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1294. STS-68 - SAREX?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-17 13:51:37 UTC
From: rjgrocho@aud.alcatel.com
Message-ID: <32t4l9$ee1@fozzy.aud.alcatel.com>
Source record: 26947

I haven't yet seen anything that sez STS-68 will be a SAREX mission.
Is it? Tnx.

Robert - N5UPF

1295. Where can I find RG-302 & RG-303 ?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-17 14:53:52 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <32t97o$h80@chnews.intel.com>
Source record: 26948
Cross-posted to: sci.electronics,rec.radio.swap,rec.radio.amateur.swap,rec.radio.amateur.space,rec.radio.amateur.misc,rec.radio.amateur.homebrew,rec.radio.amateur.equipment,rec.radio.amateur.antenna

Im rebuilding the phaseing delay lines for my KLM amateur satellite yagis and need to located a source to acquire about ten feet of RG-302 75 ohms and ten feet of RG-303 50 ohms, teflon coax cable.

RG-302 & RG-303 both have teflon dielectric and a silvered copper shield, both have inner conductors of silver-plated copper-plated steel. They are designed for high-temperature operation. I suspect they were selected by the antenna manufacturer because of low temperature coefficients. I don't want to use Radio Shack 75 ohm TV cable.

Different velocity factors between teflon and polyethylene.

polyethylene = 66.5% teflon = 69%

KLM sells the complete phaseing kit replacements for $49 each, however I feel I should be able to replace just the coax for at least half that price.

If anyone knows of a source for RG-302 & RG-303, please post here or reply via eMAIL direct.

Thanks and 73s,
Tom - WB7ASR... (not speaking for Intel)

tom_boza@ccm.hf.intel.com

1296. Which is better, phase shift or delay lines?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-17 17:19:11 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <32th6r$q53@chnews.intel.com>
Source record: 26949
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

> KE4ZV writes:
> To reverse the polarization sense, IE RHCP to LHCP, introduce a 180
> degree phase shift in the feed to one dipole. You can do this by
> swapping the outer and inner conductor connections at one dipole,
> or by adding 1/2-wave (electrical) length of 50 ohm coax in one
> leg of the splitter. Of course RHCP and LHCP depend on which end
> of the antenna you are looking at.

I have the LKM satellite antenna pair for 2 meters and 70 cm. The two meter cross yagis are feed using the outer/inner coax swapping method, however the 70 cm cross yagis use the insertion of an electrical 1/2 wavelength delay line in series with one of the driven elements.

Which method is better? Why?

Tom WB7ASR

tom_boza@ccm.hf.intel.com

1297. Re: STS-68 - SAREX?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 00:25:03 UTC
From: hrsblackwell@hrs.gsfc.nasa.gov
Message-ID: <hrsblackwell-1708942025030001@n3kwu.gsfc.nasa.gov>
Source record: 26950

In article <32t4l9$ee1@fozzy.aud.alcatel.com>, rjgrocho@aud.alcatel.com wrote:

> I haven't yet seen anything that sez STS-68 will be a SAREX mission.
> Is it? Tnx.
>
> Robert - N5UPF

STS-64 is the next SAREX mission. Due for launch Sept 9 nominally

Jim Blackwell, N3KWU

1298. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 02:10:29 UTC
From: rkirk1@umbc.edu
Message-ID: <32uful$io0@news.umbc.edu>
Source record: 27020
Cross-posted to: alt.2600,rec.radio.amateur.homebrew,rec.radio.amateur.misc,rec.radio.amateur.space

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
: In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net (Mark Austin) writes:
: >
: >I had an idea. How about linking up a GPS with a cellular phone and
: >a large battery to power both for a couple of days. Then dial a number
: >on the cellular where you want the GPS to send it's location info and
: >drop the whole bundle into someone's car. Since GPS info can be used
: >with several very cheap street mapping systems (Delorme for one) you'll
: >be able to sit at home and watch them driving down the street on
: >your home computer. Should be able to do this cheap. A couple of
: >hundred dollars (with cheap GPS and cheap phone). I have no ideas
: >on keeping cellular costs down though. One thought would be to set
: >the phone to answer and power up the whole gizmo and then shut down
: >after a call is placed into it. You wouldn't get a continuous
: >signal but you'd be able to find where someone is on demand (if they're
: >within cellular calling range). Such a setup could last for a LONG
: >time with the proper battery.

: You aren't going to be able to get a GPS and cell phone for a couple
: hundred dollars. The cheapest GPS receivers are around $400, and so
: are cell phones unless you roll their cost into a long term service
: contract. And monthly and per minute cell phone charges will mount
: up fairly rapidly. By using packet radio, amateur or commercial,
: you can send position updates on a regular basis without incurring
: quite as much cost.

: DeLorme Mapping and City Streets are a couple of commercial map
: systems that work with GPS. However, APRS (Automatic Packet Reporting
: System) is in some ways better. While it lacks the friendly user
: interface of the commercial products, and it's pre-made map databases
: are skimpy, you can make your own maps, and it works with local and
: remote GPS receivers (using packet UI frames for the latter). It also
: supports other information about the remote sites such as range and
: bearing data from DF equipment, and arbitary text messages.

: However, what many of us want is *differential* GPS. The Coast Guard,
: FAA, and others send out position deltas from a fixed benchmark
: receiver that are received and used to correct the reading of the local
: GPS receiver. These transmissions are either at MF or VHF depending on
: the system. A special receiver is required, and either a GPS receiver
: designed to work with differential signals, or a PC that can take the
: timestamped position reports and reconcile them via software, is used
: to give a true position. This method removes the deliberate SA jitter,

: and other error sources such as varying atmospheric propagation factors,
: from the position data. This allows much greater precision in determining
: location than raw GPS alone.

: It would be nice if the APRS author would support this mode in his
: software. Some of us are willing to set up benchmark receivers on
: the amateur bands. That timestamped data could be used to correct
: the positions reported by the rover receivers over packet.

: Gary
: --
: Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
: Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
: 534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
: Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

This has already been done on an experimental basis here in the Annaoplis
area: A cooperating ham otransmits a differential signal on the same
freq as the APRS net. Receive it thru your TNC and it goes into the
GPS receiver. Works fine.

(Wierd trouble with a missing letter - regrets)

Bob
ht os

1299. Re: Where can I find RG-302 & RG-303 ?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 14:08:34 UTC
From: anto@gate.net
Message-ID: <32vq12$j43@tequesta.gate.net>
Source record: 26952
Cross-posted to: sci.electronics,rec.radio.swap,rec.radio.amateur.swap,rec.radio.amateur.space,rec.radio.amateur.misc,rec.radio.amateur.homebrew,rec.radio.amateur.equipment,rec.radio.amateur.antenna

Tom WB7ASR (tom_boza@ccm.hf.intel.com) wrote:

: Im rebuilding the phaseing delay lines for my KLM amateur satellite yagis and
: need to located a source to acquire about ten feet of RG-302 75 ohms and ten
: feet of RG-303 50 ohms, teflon coax cable.

: RG-302 & RG-303 both have teflon dielectric and a silvered copper shield, both
: have inner conductors of silver-plated copper-plated steel. They are designed
: for high-temperature operation. I suspect they were selected by the antenna
: manufacturer because of low temperature coefficients. I don't want to use Radio
: Shack 75 ohm TV cable.

: Different velocity factors between teflon and polyethylene.

: polyethylene = 66.5% teflon = 69%

: KLM sells the complete phaseing kit replacements for $49 each, however I feel
: I should be able to replace just the coax for at least half that price.

: If anyone knows of a source for RG-302 & RG-303, please post here or reply via
: eMAIL direct.

: Thanks and 73s,
: Tom - WB7ASR... (not speaking for Intel)

: tom_boza@ccm.hf.intel.com

Nemal Electronics in Miami, FL will do mail order. I don't
have the number but 1(305)555-1212 should get you the number.

Nigel, N4TKC

anto@gate.net

1300. Re: Which is better, phase shift or delay lines?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 16:55:35 UTC
From: zlau@arrl.org
Message-ID: <1994Aug18.165535.17920@arrl.org>
Source record: 26960
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.antenna

Tom WB7ASR (tom_boza@ccm.hf.intel.com) wrote:

: > KE4ZV writes:
: > To reverse the polarization sense, IE RHCP to LHCP, introduce a 180
: > degree phase shift in the feed to one dipole. You can do this by
: > swapping the outer and inner conductor connections at one dipole,
: > or by adding 1/2-wave (electrical) length of 50 ohm coax in one
: > leg of the splitter. Of course RHCP and LHCP depend on which end
: > of the antenna you are looking at.

: I have the LKM satellite antenna pair for 2 meters and 70 cm. The two meter
: cross yagis are feed using the outer/inner coax swapping method, however the
: 70 cm cross yagis use the insertion of an electrical 1/2 wavelength delay line
: in series with one of the driven elements.

: Which method is better? Why?

If cost is no object, a transfer relay/switch can swap the connections.
It wouldn't have the problem of additional coax loss, which can be a
factor if you want to hear really well on 70 cm and above without
a preamp for each dipole. I suspect that KLM couldn't find cheap
relays that could do the coax swapping method at 70 cm, though I'm sure
you could get any of the relay companies to design what you need if you
had enough $$$. I've not heard of any amateurs building their own
UHF transfer relays.

: tom_boza@ccm.hf.intel.com

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

1301. Address for KC0TO/7 in Wyoming

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 17:47:05 UTC
From: Wayne_Estes@csg.mot.com
Message-ID: <9408181245.ZM2548@SALCIUS2>
Source record: 26953

My first AO-13 contact was with KC0TO/7 in Wyoming on 30 July at 0607 UTC.

He gave the QSL route, but I misplaced it.
My card to the callbook address for KC0TO was returned undeliverable.

Does anyone have the correct QSL route?

-- Wayne Estes WD5FFH Wayne_Estes@csg.mot.com

1302. Kantronics KPC-9612

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 18:05:35 UTC
From: randyh@gvgadg.gvg.tek.com
Message-ID: <3307tf$deh@gv-gate.gvg.tek.com>
Source record: 26954

Does anyone know if the new Kantronics KPC-9612 dual speed TNC can be used to communicate with the 9600 baud satellites?

Randy
WA2AGE

1303. satellite communications

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 19:17:39 UTC
From: jackson@longlast.cs.nyu.edu
Message-ID: <330c4k$b19@thecourier.cims.nyu.edu>
Source record: 26957

I just got back from our library with a 300+ page book entitled "Satellite Communications" dated 1993. I've been hooked on them ever since I picked up a PCTrak 3 a couple weeks ago.

Any suggested readings for amateur uses of these satellites?

I have been following AO-13 specifically because of the amount of time covered by mutual visibility with San Francisco.

I'm mostly interested in knowing what kind of services they offer.. store and forward? real-time QSO's? what about imaging? satellite-to-satellite links for real time chats?

any help would be greatly appreciated

--
Steven Jackson, Assistant to the Chair of Computer Science
Courant Institute of Mathematical Sciences, New York University
251 Mercer Street, NY NY 10012

Work <-- (forwarded) Home
jackson@cs.nyu.edu, jcksnste@acfcluster.nyu.edu, sjackson@cjbbs.com

1304. New satellite Windows programs

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 20:10:16 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <330fuc$ia3@chnews.intel.com>
Source record: 26955
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.digital.misc

I just received my copy of the July/August 1994 issue of THE AMSAT JOURNAL.
In the journal, pages 6-9, they talk about a new Windows PB and PG like
program by ZL2TPO. The program also has a fully intergrated color graphic
world map showing satallite positions and foot prints. It has full support
for the Kansas City Tracker/Tuner, with the optional Windows program by
KC6WYG, on page 10.

Both programs can be purchased from AMSAT direct for $40.00 @ 301-589-6062
All proceeds go to the Phase3D program.

73s, Tom WB7ASR...

1305. Need 9600 baud mod info for IC271/471

Newsgroup: rec.radio.amateur.space
Date: 1994-08-18 20:33:11 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <330glh$k8j@chnews.intel.com>
Source record: 26956
Cross-posted to:
rec.radio.amateur.space,rec.radio.amateur.misc,rec.radio.amateur.equipment,rec.radio.amateur.digital.misc,rec.ham-radio.misc

Im looking for 9600 baud modification info for the ICOM 271 & 471.

Thanks & 73s,
Tom WB7ASR...

1306. Satellite tracking and Mean Anomaly

Newsgroup: rec.radio.amateur.space
Date: 1994-08-19 03:02:05 UTC
From: david@pitvax.xx.rmit.edu.au
Message-ID: <3317jp$443@aggedor.rmit.EDU.AU>
Source record: 26958

I have been using PCTrack 3 as my first tracking program and find it useful and accurate but it doesn't tell me anything about mean anomaly (MA). I see from the AMSAT Bulletins that AO-13 for example has various transponder schedules depending on where it is in its orbit from perigee.

I'm wondering if there is an easy way to relate MA to UTC for a particular bird? Or do 'better' tracking programs track MA as well as position/footprint? What about the programs sold by AMSAT? I'm not a member of AMSAT-Aust. yet but have the information and plan to sbscribe soon.

David VK3JKP

1307. Re: Satellite tracking and Mean Anomaly

Newsgroup: rec.radio.amateur.space
Date: 1994-08-19 03:50:04 UTC
From: sschmautz@aol.com
Message-ID: <331a5c$m5f@search01.news.aol.com>
Source record: 26959

In article <3317jp$443@aggedor.rmit.EDU.AU>, david@pitvax.xx.rmit.edu.au writes:

Hi David, does your probram give you phase numbers? If so, thats the same thing. Other programs do give the MA/Phase numbers, its an important thing to know. CUL Scott WB2UZR sschmautz@aol.com

1308. MA question VK3JKP

Newsgroup: rec.radio.amateur.space
Date: 1994-08-19 11:13:33 UTC
From: ken@archie.ti.com
Message-ID: <940819111333@ken_durham.sc.ti.com>
Source record: 27011

The reply function wouldn't work, so I'll just post this:

AMSAT offers a tracking program that will give you MA (phase) for a satellite as a function of time. It is called Instantrack and costs $70 for members and somewhat more for non-members.

MA is the satellite orbit phase in units from 0 to 256 which corresponds to 0 to 360 deg. One orbit is MA 256 or 360 deg. (180 deg. = MA 128 and so on.)

The program also tells you the mode (if you keep the schedule updated.)

Looking forward to a QSO with you on AO-10 or AO-13.

de K5MBV

1309. Low Orbit transmitter needed!

Newsgroup: rec.radio.amateur.space
Date: 1994-08-19 21:02:54 UTC
From: lucifer@teleport.com
Message-ID: <lucifer.27.00150CF9@teleport.com>
Source record: 27013

Please respond via EMAIL.

FOAF, along with others, may attempt to build a home-brew solid-fuel
rocket capable of reaching a brief low-altitude orbit.
As part of a "prank" he wants to include a tiny transmitter that could be
picked up on the ground. Obviously it has to be extremely tiny, lightweight,
and foolproof.
The transmission could be any type of code that would be interpreted as
15 numbers ranging from 0-9/
Also it has to be DIRT CHEAP or free.

Where would somebody find expertise for such a project?

If the cost of the rocket components is low enough, more than one
transmitter could be needed (eventually).

1310. Two-Line Orbital Element Sets (TLE453)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-19 22:11:18 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.777334278@afit.af.mil>
Source record: 27015

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #453 -
Alouette 1
1 00424U 62049 94230.96110023 .00000041 00000-0 37842-4 0 197
2 00424 80.4619 223.0622 0022592 316.7892 43.1489 13.67816722590986
ATS 1
1 02608U 66110A 94226.63187160 -.00000316 00000-0 10000-3 0 8955
2 02608 14.5805 359.8403 0010106 47.8868 91.1514 1.00356213 18058
ATS 3
1 03029U 67111A 94230.86436696 -.00000133 00000-0 10000-3 0 2339
2 03029 14.6909 6.8664 0009810 265.3362 260.7385 1.00272976 98068
Cosmos 398
1 04966U 71016A 94230.62293869 .00139993 71338-5 25899-3 0 4412
2 04966 51.4442 82.1248 0968012 191.2375 166.5104 14.02113563781461
Starlette
1 07646U 75010A 94230.76406407 -.00000131 00000-0 89394-5 0 8069
2 07646 49.8268 266.4187 0206022 182.9299 177.0394 13.82186847986505
LAGEOS
1 08820U 76039A 94221.81627451 .00000002 00000-0 10000-3 0 183
2 08820 109.8185 153.9638 0044252 273.9820 85.5761 6.38664533170571
ETS-2
1 09852U 77014A 94219.48934716 -.00000296 00000-0 10000-3 0 9756
2 09852 12.2413 40.9026 0003241 64.4033 333.2913 1.00011018 10849
GOES 2
1 10061U 77048A 94228.27053718 .00000049 00000-0 00000+0 0 3842
2 10061 11.3061 44.9804 0001489 31.4031 210.3680 1.00288869 7712
IUE
1 10637U 78012A 94230.32839052 -.00000292 00000-0 10000-3 0 275
2 10637 34.7054 93.9029 1317948 37.8101 260.6620 1.00248348 13340
GPS BI-01
1 10684U 78020A 94220.74255890 .00000002 00000-0 10000-3 0 2891
2 10684 64.6756 43.9524 0062415 163.6827 196.5634 1.98069650105973
```

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GPS BI-02
1 10893U 78047A 94219.33791864 .00000022 00000-0 10000-3 0 880
2 10893 63.5065 282.7841 0215743 13.8651 346.8384 2.01627634119105
GOES 3
1 10953U 78062A 94229.43215037 .00000028 00000-0 10000-3 0 3518
2 10953 10.2487 47.7457 0005932 69.3639 186.3215 1.00261127 12336
SeaSat 1
1 10967U 78064A 94230.86806670 -.00000034 00000-0 33386-4 0 3154
2 10967 108.0006 231.9264 0002115 237.2247 122.8694 14.37972590845379
GPS BI-03
1 11054U 78093A 94225.60987089 .00000003 00000-0 10000-3 0 2065
2 11054 63.2234 280.0596 0044210 179.0340 181.0079 1.93504977115624
Nimbus 7
1 11080U 78098A 94230.71286358 -.00000070 00000-0 -24899-4 0 4192
2 11080 99.0462 111.9821 0008912 329.8918 30.1722 13.83727936798722
GPS BI-04
1 11141U 78112A 94225.38740052 -.00000003 00000-0 00000+0 0 9047
2 11141 64.7110 45.1433 0047718 25.0526 335.2760 1.92888698 4881
GPS BI-05
1 11690U 80011A 94226.74805473 .00000002 00000-0 10000-3 0 8195
2 11690 65.0737 45.5343 0142773 197.1606 162.3895 2.00557968120712
GPS BI-06
1 11783U 80032A 94230.41709892 .00000024 00000-0 10000-3 0 9946
2 11783 62.6119 276.1133 0210465 28.8116 332.4430 2.03457361105224
GOES 5
1 12472U 81049A 94230.72694734 -.00000049 00000-0 10000-3 0 7848
2 12472 6.9535 57.3331 0006684 20.6379 32.7243 1.00335784 6399
Cosmos 1383
1 13301U 82066A 94230.12448840 .00000024 00000-0 10535-4 0 3188
2 13301 82.9296 264.3430 0026209 286.4109 73.4157 13.68057161605890
LandSat 4
1 13367U 82072A 94229.17730149 .00000026 00000-0 15733-4 0 5219
2 13367 98.1747 286.6031 0008187 66.1163 294.0893 14.57124914642949
IRAS
1 13777U 83004A 94230.05573975 -.00000162 00000-0 -81704-4 0 6845
2 13777 98.9733 59.7226 0012117 140.6436 219.5607 13.99214161259792
Cosmos 1447
1 13916U 83021A 94229.78757606 .00000040 00000-0 26386-4 0 4196
2 13916 82.9472 326.1363 0036681 216.1172 143.7505 13.74312914571791
TDRS 1
1 13969U 83026B 94230.61631120 -.00000217 00000-0 10000-3 0 3275
2 13969 7.8201 50.4442 0008545 89.1636 134.0734 1.00267264 14670
GOES 6
1 14050U 83041A 94230.36636763 .00000007 00000-0 10000-3 0 2527
2 14050 5.7340 60.2825 0004530 6.1754 267.2355 1.00231547 13400
OSCAR 10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
LandSat 5
1 14780U 84021A 94229.14585929 .00000027 00000-0 15984-4 0 1132
```

```
2 14780 98.1571 287.6815 0005942 73.7924 286.3928 14.57137329556356
UoSat 2
1 14781U 84021B 94230.06784702 .00000094 00000-0 23839-4 0 7189
2 14781 97.7856 241.8945 0013013 72.1530 288.1092 14.69237688559399
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94229.91456422 .00000017 00000-0 15928-5 0 6192
2 15055 82.9545 19.5179 0028981 46.3069 314.0481 13.73608861509108
GPS BI-10
1 15271U 84097A 94230.46369141 .00000023 00000-0 10000-3 0 8376
2 15271 62.3289 276.2489 0147553 349.3987 10.3810 2.00584564 71852
Cosmos 1602
1 15331U 84105A 94230.86141489 .00000302 00000-0 32872-4 0 3108
2 15331 82.5312 19.0302 0021004 1.5618 358.5667 14.84444728533815
NOAA 9
1 15427U 84123A 94230.74026783 .00000051 00000-0 50951-4 0 9194
2 15427 99.0420 281.9433 0015783 44.9811 315.2634 14.13635705499096
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94230.34408740 .00002126 00000-0 35851-4 0 7087
2 16609 51.6455 235.4318 0000833 276.6367 83.4530 15.56806591485700
SPOT 1
1 16613U 86019A 94229.22290248 .00000090 00000-0 62356-4 0 7146
2 16613 98.6846 301.7752 0001297 58.1634 301.9663 14.20365268125228
Cosmos 1766
1 16881U 86055A 94230.07971947 .00000244 00000-0 26716-4 0 2258
2 16881 82.5183 77.7551 0020738 27.2675 332.9623 14.83472000434631
EGP
1 16908U 86061A 94230.24072683 -.00000097 00000-0 00000+0 0 9171
2 16908 50.0096 253.6265 0011430 111.0744 249.1314 12.44410354 33112
NOAA 10
1 16969U 86073A 94230.72387486 .00000004 00000-0 19935-4 0 8150
2 16969 98.5101 237.8196 0013544 142.5905 217.6220 14.24901989411403
MOS-1
1 17527U 87018A 94230.17268402 .00000091 00000-0 99794-4 0 1099
2 17527 99.0298 297.5500 0001483 73.4710 286.6597 13.94906880381583
GOES 7
1 17561U 87022A 94229.59793295 -.00000069 00000-0 10000-3 0 9714
2 17561 1.6800 74.9580 0004499 356.9318 356.3931 1.00272774 10585
Kvant-1
1 17845U 87030A 94229.83055558 .00004056 00000-0 62249-4 0 9529
2 17845 51.6455 238.0032 0000826 279.1252 80.9647 15.56806339485710
DMSP B5D2-3
1 18123U 87053A 94230.50347858 .00000008 00000-0 26640-4 0 6050
2 18123 98.7865 61.2804 0014784 6.1871 353.9484 14.15368018369908
RS-10/11
```

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1 18129U 87054A 94230.18854328 .00000036 00000-0 23438-4 0 9377
2 18129 82.9249 283.0178 0010613 206.7553 153.3046 13.72340414358417
Meteor 2-16
1 18312U 87068A 94230.25799488 .00000058 00000-0 38486-4 0 3174
2 18312 82.5563 162.6325 0011731 306.4900 53.5183 13.84035431353644
Meteor 2-17
1 18820U 88005A 94230.45251693 .00000012 00000-0 -24744-5 0 3706
2 18820 82.5378 219.0487 0017273 11.8317 348.3249 13.84719404330972
DMSP B5D2-4
1 18822U 88006A 94229.79835151 -.00000028 00000-0 59289-5 0 7232
2 18822 98.4330 82.1944 0006155 151.8269 208.3245 14.23114087339366
Glonass 34
1 19163U 88043A 94226.13897151 -.00000015 00000-0 10000-3 0 9149
2 19163 65.0521 108.4999 0006754 144.2941 215.8089 2.13102387 47896
Glonass 36
1 19165U 88043C 94222.90998084 .00000018 00000-0 10000-3 0 3099
2 19165 65.0238 108.5698 0002613 319.2436 40.8088 2.13102253 48442
METEOSAT 3
1 19215U 88051A 94229.87135601 -.00000279 00000-0 10000-3 0 9697
2 19215 1.8593 71.7177 0000693 122.6628 10.1323 1.00284343 10535
AO-13
1 19216U 88051B 94230.71383683 .00000146 00000-0 10000-4 0 9499
2 19216 57.7439 235.8195 7227370 348.2718 1.3109 2.09721888 15825
OKEAN 1
1 19274U 88056A 94230.24522755 .00000252 00000-0 28593-4 0 9260
2 19274 82.5136 177.5990 0019749 160.3665 199.8316 14.82203212330272
Meteor 3-2
1 19336U 88064A 94230.15619678 .00000051 00000-0 10000-3 0 3139
2 19336 82.5418 279.8359 0018229 105.7988 254.5132 13.16968664291414
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2 19503 65.7700 347.3837 0006792 164.8786 195.1419 2.13102008 46012
NOAA 11
1 19531U 88089A 94230.80881093 .00000026 00000-0 39093-4 0 7373
2 19531 99.1776 221.2689 0011657 322.5036 37.5320 14.13010240303980
TDRS 2
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2 19548 1.1422 76.8611 0002128 22.6327 193.4268 1.00274058 8810
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2 19749 65.0010 108.0273 0006132 251.9753 108.0178 2.13101462 43540
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2 19802 55.1169 137.2561 0029863 178.9512 181.0772 2.00556058 40297
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1 19876U 89020B 94218.36245949 -.00000076 00000-0 10000-3 0 489
2 19876 0.5569 66.4320 0001833 65.5439 304.9054 1.00272309 667
TDRS 3
1 19883U 89021B 94227.05534144 -.00000285 00000-0 00000+0 0 9668
2 19883 0.0322 87.3666 0002615 207.5202 7.1861 1.00267168192383
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2 20061 54.6226 313.9240 0134642 209.4276 149.8674 2.00564789 38032
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2 20103 82.9555 241.6382 0038778 114.0498 246.4721 13.73841786256892
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2 20217 0.3776 74.5609 0000876 26.7873 258.8260 1.00269266 18723
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1 20302U 89085A 94225.27622646 .00000035 00000-0 00000+0 0 9531
2 20302 53.5454 254.3663 0005489 235.5678 124.4343 2.00567035 35317
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2 20305 82.5428 227.7549 0004428 126.2587 233.8901 13.04406980230855
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2 20322 98.9767 244.4356 0009774 99.7145 260.5122 14.03442587242933
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SPOT 2
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2 20442 98.5970 316.0888 0012832 12.7780 347.3723 14.30117090238500
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2 20508 82.9522 16.9004 0046016 68.6393 291.9663 13.73478915224010
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Glonass 45
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Kristall
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2 20826 82.5254 96.2969 0011905 232.5853 127.4208 13.83587965196398
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2 21578 98.4425 306.3049 0005860 103.0511 257.1335 14.38818393162128
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1 21639U 91054B 94229.23144708 .00000060 00000-0 10000-3 0 7791
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ASTRO-D
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2 22739 98.9514 174.9887 0009632 310.1365 49.8968 14.10903585 52809
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2 22828 98.6459 305.4731 0011216 16.7122 343.4422 14.28063026 14636
PO-28
1 22829U 93061G 94230.24152028 .00000009 00000-0 21183-4 0 3075
2 22829 98.6462 305.4943 0010957 18.6227 341.5350 14.28036928 46550
KO-25
1 22830U 93061H 94230.23529462 -.00000015 00000-0 11297-4 0 3192
2 22830 98.5508 302.0446 0011933 359.4238 0.6924 14.28061000 46555
GPS BIIA-23
1 22877U 93068A 94229.58643759 -.00000012 00000-0 10000-3 0 1535
2 22877 55.2277 75.9526 0028141 288.3222 71.4301 2.00571225 5963
METEOSAT 6
1 22912U 93073B 94230.04706808 -.00000101 00000-0 00000+0 0 1184
2 22912 0.7744 266.9337 0002772 252.4031 174.8248 1.00276507 1149
HST Array
1 22920U 90037C 94228.92691150 .00004135 00000-0 33458-3 0 1836
2 22920 28.4661 192.4303 0004305 174.1707 185.8948 14.97325875 38606
Meteor 3-6
1 22969U 94003A 94230.31827601 .00000051 00000-0 10000-3 0 890
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2 22969 82.5563 12.4109 0016600 107.4079 252.8858 13.16723987 27023
TUBSAT-B
1 22970U 94003B 94229.84669287 .00000051 00000-0 10000-3 0 791
2 22970 82.5557 12.7186 0017130 106.5159 253.7833 13.16822184 26968
ODERACS A
1 22990U 94006B 94230.62619436 .00109890 15620-4 21223-3 0 1604
2 22990 56.9801 36.4694 0007325 320.8890 39.1645 16.00288877 30134
ODERACS B
1 22991U 94006C 94230.93248451 .00105783 15204-4 21165-3 0 1491
2 22991 56.9788 35.6333 0007271 328.5643 31.4999 15.99691558 30173
ODERACS E
1 22994U 94006F 94227.98508364 .00032772 00000-0 14627-3 0 1101
2 22994 56.9812 57.4691 0007999 295.4814 64.5430 15.84005088 29583
ODERACS F
1 22995U 94006G 94230.50213548 .00023400 00000-0 10378-3 0 1467
2 22995 56.9822 45.8791 0007906 315.0650 44.9493 15.84342410 29980
BREMSAT
1 22998U 94006H 94229.91460965 .00028865 00000-0 13097-3 0 1258
2 22998 56.9861 49.7698 0005799 346.0032 14.0875 15.83747457 29724
GPS BIIA-24
1 23027U 94016A 94227.67354897 -.00000063 00000-0 00000+0 0 818
2 23027 54.9829 17.0824 0063387 191.1922 168.6779 2.00562471 3236
Glonass 62
1 23043U 94021A 94229.44233750 -.00000085 00000-0 00000+0 0 828
2 23043 64.8020 347.2385 0007130 181.8517 178.1542 2.13102626 2731
Glonass 63
1 23044U 94021B 94229.79446370 -.00000087 00000-0 00000+0 0 687
2 23044 64.8051 347.2299 0029763 201.8982 157.9807 2.13103423 2741
Glonass 64
1 23045U 94021C 94228.09304540 -.00000076 00000-0 00000+0 0 859
2 23045 64.7964 347.3044 0009665 38.6744 321.4073 2.13102536 2707
GOES 8
1 23051U 94022A 94230.44647271 -.00000210 00000-0 00000+0 0 1547
2 23051 0.3179 265.1453 0002440 292.4223 199.8671 1.00273751 921
MSTI 2
1 23101U 94028A 94225.03509349 .00002742 00000-0 56241-4 0 601
2 23101 97.1122 58.2065 0011085 300.1729 59.8487 15.46848338 14831
STRV-1A
1 23125U 94034B 94225.99611970 .00000302 00000-0 77675-4 0 281
2 23125 6.9612 161.8679 7283608 224.8076 46.0115 2.27324260 1321
STRV-1B
1 23126U 94034C 94223.89903223 .00000060 00000-0 53568-4 0 280
2 23126 6.9512 163.0173 7283191 222.7140 49.0049 2.26917695 1272
Soyuz TM-19
1 23139U 94036A 94229.83055558 .00004056 00000-0 62249-4 0 594
2 23139 51.6455 238.0032 0000826 279.1252 80.9647 15.56806339 7397
Nadezhda 4
1 23179U 94041A 94229.89789992 .00000027 00000-0 11882-4 0 159
2 23179 82.9440 12.6296 0034913 191.9607 168.0725 13.75656729 4778
Cosmos 2283
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1 23182U 94042A 94230.93982559 .00336738 57940-5 15995-3 0 693
2 23182 67.1163 90.0088 0100999 93.7771 265.7964 16.09914043 4650
APSTAR A1
1 23185U 94043A 94231.25852221 -.00000362 00000-0 00000+0 0 414
2 23185 0.0223 232.9690 0002191 21.8139 296.6723 1.00273413 316
1994043B
1 23186U 94043B 94230.45888936 .00014347 11145-5 14406-2 0 342
2 23186 26.8752 85.0893 7604542 192.5802 122.9985 1.91077157 543
Cosmos 2284
1 23187U 94044A 94229.88627065 .00084085 38504-5 62545-4 0 469
2 23187 70.3766 75.3726 0061606 81.5983 279.2220 16.10990828 3141
Cosmos 2285
1 23189U 94045A 94228.96787967 .00000049 00000-0 78791-4 0 124
2 23189 74.0292 236.1068 0026307 241.2690 118.5776 13.71650697 1941
1994045B
1 23190U 94045B 94230.99097582 .00000703 00000-0 78125-3 0 171
2 23190 74.0183 232.6950 0021344 223.2032 136.7384 13.73298464 2220
APEX
1 23191U 94046A 94230.11366123 .00001448 00000-0 12206-3 0 150
2 23191 69.9721 219.4710 1393421 142.3543 228.3801 12.52716333 1830
DIRECTV
1 23192U 94047A 94229.44977967 -.00000138 00000-0 00000+0 0 195
2 23192 0.0490 145.0387 0004780 355.6854 245.7634 1.00243777 197
1994047B
1 23193U 94047B 94229.81367963 .00018224 00000-0 27255-2 0 105
2 23193 26.8998 126.9494 7471844 186.3071 150.8902 2.06241795 302
Cosmos 2286
1 23194U 94048A 94228.52128360 -.00000900 00000-0 10000-3 0 115
2 23194 62.9023 279.2741 7381285 316.3067 5.0495 2.00698546 244
1994048B
1 23195U 94048B 94231.06282928 .00215396 75983-5 43805-3 0 213
2 23195 62.8228 228.7263 0202804 119.4616 242.6884 15.71984559 2206
1994048C
1 23196U 94048C 94230.98587179 .00760691 77260-5 55423-3 0 302
2 23196 62.8367 228.8462 0220557 122.2554 240.0160 15.80858149 2193
1994048D
1 23197U 94048D 94230.34659267 .00001446 00000-0 26224-2 0 81
2 23197 62.8772 278.9924 7354128 316.3112 5.1162 2.03842735 272
1994046B
1 23198U 94046B 94228.91615486 .00001652 00000-0 13895-3 0 108
2 23198 69.9777 221.5489 1393115 143.6789 226.7509 12.52691814 1687
BrazilSat
1 23199U 94049A 94229.47925478 -.00000312 00000-0 10000-3 0 185
2 23199 0.0766 339.4692 0029218 272.6148 185.0459 1.00593634 95
1994049B
1 23200U 94049B 94230.11799769 .00000061 00000-0 00000+0 0 245
2 23200 0.0742 283.1302 0068461 14.9794 107.7445 1.00926805 76
1994049C
1 23201U 94049C 94228.21423671 .00000245 00000-0 75081-3 0 69
2 23201 6.9208 119.9191 7314187 182.9242 167.2071 2.18770205 67
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1994049D
1 23202U 94049D 94228.86102885 .00048038 00000-0 65539-2 0 150
2 23202 6.9634 119.0988 7287412 182.8969 167.4909 2.28988528 74
Glonass 65
1 23203U 94050 A 94230.67678059 .00000000 00000-0 99999-4 0 130
2 23203 064.8659 226.6554 0097071 233.3584 125.7822 02.16249374000153
Glonass 66
1 23204U 94050B 94231.17621844 .00000049 00000-0 00000+0 0 219
2 23204 64.8596 226.6693 0087437 65.6986 295.0699 2.10183830 167
Glonass 67
1 23205U 94050C 94230.22298711 .00000062 00000-0 00000+0 0 178
2 23205 64.8389 226.6324 0004742 219.8578 140.1271 2.13124639 146
1994050D
1 23206U 94050D 94223.82175926 .08824307 77953-5 20801-3 0 62
2 23206 64.8308 226.3368 0015812 284.5786 76.0430 16.44777071 38
1994050E
1 23207U 94050E 94223.88237923 .47560365 76960-5 37048-3 0 56
2 23207 64.8294 226.1208 0004222 316.6284 43.4618 16.52499356 40
1994050F
1 23208U 94050F 94227.87178241 .00000089 00000-0 00000+0 0 59
2 23208 64.8412 226.7238 0012354 281.5462 78.9169 2.13428447 77
1994050G
1 23209U 94050G 94229.60649969 .00000108 00000-0 00000+0 0 33
2 23209 64.9043 224.6137 5799014 297.2126 15.9187 4.23179048 147
1994050H
1 23210U 94050H 94229.60673603 .00000108 00000-0 00000+0 0 37
2 23210 64.8053 224.7826 5799179 297.1624 15.9374 4.23139078 146
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1311. satellite tracking for X?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-20 02:48:26 UTC
From: jeppe@clinet.fi
Message-ID: <jeppe.777350906@zetor.clinet.fi>
Source record: 27012

Does anyone know if there is a satellite tracking program for X-windows
that shows the satellite and its coverage over a map in real-time?
(Like Traksat, STS+ and zillions of other tracking programs for dos)
--
Joachim Paganus
jeppe@clinet.fi

1312. RE: satellite communications

Newsgroup: rec.radio.amateur.space
Date: 1994-08-20 06:33:47 UTC
From: pchien@ids.net
Message-ID: <3357mo$10f@paperboy.ids.net>
Source record: 27014

Instead of picking up the 300 page book, you should have gotten
the excellent AMSAT publication on how to use amateur radio
satellites. AO-13 is primarily a random QSOs bird, and an excellent
choice for trans-continental communications. You will need a dual
band (2 meter 70 cm.) all mode (e.g. SSB) tranceiver with a directional
antenna system. Check out my previous posts for information on the
handbook and AMSAT's address for ordering

Philip Chien KC4YER
no sig yet

In Article <330c4k$b19@thecourier.cims.nyu.edu>
jackson@longlast.cs.nyu.edu (Steven Jackson) writes:
>I just got back from our library with a 300+ page book
>entitled "Satellite Communications" dated 1993. I've
>been hooked on them ever since I picked up a PCTrak 3 a
>couple weeks ago.
>
>Any suggested readings for amateur uses of these satellites?
>
>I have been following AO-13 specifically because of the
>amount of time covered by mutual visibility with San
>Francisco.
>
>I'm mostly interested in knowing what kind of services they
>offer.. store and forward? real-time QSO's? what about
>imaging? satellite-to-satellite links for real time chats?
>
>any help would be greatly appreciated
>--
>Steven Jackson, Assistant to the Chair of Computer Science
>Courant Institute of Mathematical Sciences, New York University
>251 Mercer Street, NY NY 10012
>
> Work <-- (forwarded) Home
>jackson@cs.nyu.edu, jcksnste@acfcluster.nyu.edu, sjackson@cjbbs.com

1313. ARLK035 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-08-20 19:15:58 UTC
From: w1aw@arrl.org
Message-ID: <$arlk035.1994@ampr.org>
Source record: 27016
Cross-posted to: rec.radio.info,rec.radio.amateur.space

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SB KEP @ ARL $ARLK035
ARLK035 Keplerian data

ZCZC SK03
QST de W1AW
Keplerian Bulletin 35 ARLK035
From ARRL Headquarters
Newington, CT August 20, 1994
To all radio amateurs

SB KEP ARL ARLK035
ARLK035 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM
AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
RS-10/11
1 18129U 87054A 94230.18854328 .00000036 00000-0 23438-4 0 9377
2 18129 82.9249 283.0178 0010613 206.7553 153.3046 13.72340414358417
UO-11
1 14781U 84021B 94230.06784702 .00000094 00000-0 23839-4 0 7189
2 14781 97.7856 241.8945 0013013 72.1530 288.1092 14.69237688559399
RS-12/13
1 21089U 91007A 94229.76964672 .00000038 00000-0 24862-4 0 7186
2 21089 82.9249 325.7778 0028090 299.5502 60.2853 13.74044881177106
AO-13
1 19216U 88051B 94230.71383683 .00000146 00000-0 10000-4 0 9499
2 19216 57.7439 235.8195 7227370 348.2718 1.3109 2.09721888 15825
UO-14
1 20437U 90005B 94230.22503301 -.00000017 00000-0 10530-4 0 199
2 20437 98.5882 314.1542 0011562 13.7373 346.4123 14.29852190238453
AO-16
1 20439U 90005D 94230.20829662 .00000005 00000-0 18811-4 0 8172
2 20439 98.5972 315.4383 0011948 13.6399 346.5108 14.29906309238464
DO-17
1 20440U 90005E 94230.22654810 -.00000005 00000-0 15053-4 0 8184
2 20440 98.5965 315.7997 0011962 13.2100 346.9395 14.30045934238488
```

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WO-18
1 20441U 90005F 94229.78318475 .00000005 00000-0 18880-4 0 8201
2 20441 98.5974 315.3587 0012599 14.2545 345.8989 14.30020102238422
LO-19
1 20442U 90005G 94230.24695544 .00000014 00000-0 22175-4 0 8167
2 20442 98.5970 316.0888 0012832 12.7780 347.3723 14.30117090238500
FO-20
1 20480U 90013C 94230.82081385 .00000013 00000-0 10292-3 0 7146
2 20480 99.0459 10.8330 0540373 197.5200 160.6599 12.83227516212168
AO-21
1 21087U 91006A 94229.10619521 .00000093 00000-0 82657-4 0 5007
2 21087 82.9426 97.6402 0034106 275.5687 84.1579 13.74543414177952
UO-22
1 21575U 91050B 94230.73621705 .00000012 00000-0 18515-4 0 5212
2 21575 98.4314 303.9585 0008625 100.5122 259.7027 14.36927695162065
KO-23
1 22077U 92052B 94230.20728157 -.00000037 00000-0 10000-3 0 4165
2 22077 66.0761 150.1230 0015377 273.6862 86.2394 12.86286593 94763
KO-25
1 22830U 93061H 94230.23529462 -.00000015 00000-0 11297-4 0 3192
2 22830 98.5508 302.0446 0011933 359.4238 0.6924 14.28061000 46555
KO-25?
1 22828U 93061F 94230.23484502 .00000002 00000-0 18579-4 0 2929
2 22828 98.6459 305.4731 0011216 16.7122 343.4422 14.28063026 14636
IO-26
1 22826U 93061D 94230.23881651 -.00000002 00000-0 17162-4 0 3146
2 22826 98.6502 305.4600 0009953 32.3600 327.8186 14.27736476 46541
AO-27
1 22825U 93061C 94230.19226085 -.00000022 00000-0 90193-5 0 3142
2 22825 98.6471 305.3640 0009412 31.8976 328.2766 14.27631614 46534
PO-28
1 22829U 93061G 94230.24152028 .00000009 00000-0 21183-4 0 3075
2 22829 98.6462 305.4943 0010957 18.6227 341.5350 14.28036928 46550
Mir
1 16609U 86017A 94230.34408740 .00002126 00000-0 35851-4 0 7087
2 16609 51.6455 235.4318 0000833 276.6367 83.4530 15.56806591485700

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
August 23, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
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1314. SPACE SHUTTLE FREQUENCIES

Newsgroup: rec.radio.amateur.space
Date: 1994-08-21 05:43:34 UTC
From: ncschult@vela.acs.oakland.edu
Message-ID: <ncschult.777447814@vela.acs.oakland.edu>
Source record: 27017

I HAVE A PRO 43 AND I'D LIKE THE FREQUENCIES TO LISTEN TO THE SPACE SHUTTLE WHILE IT'S UP.I LIVE IN MICHIGAN SO I DON'T NEED THOSE FOR THEE LAUNCH.

THANKS,NCS

1315. ANS-232 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-08-21 15:31:39 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-232.01.1994@ampr.org>
Source record: 27018
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-232.01
DOVE-OSCAR-17 STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 232.01 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 20, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-232.01

DOVE-OSCAR-17 (DO-17) Status Report

After extensive development and testing on the ground, another in a series of planned software and hardware tests was activated in the DOVE (DO-17) satellite on 8/3/94 at about 04:40 UTC.

This software sends ASCII telemetry for 90 seconds, then a sequence of 8 tones from the on-board digital-to-analog converter (DAC) followed by three repetitions of the "Hi this is DOVE..." phrase from the voice synthesizer. There is also a new line of status information sent occasionally for test and debugging purposes called VSTAT. It contains data useful to developers and engineers. The purpose of this software is to test the DAC, the two way connection between the 68HC11 processor in the DOVE module and the V40 main processor in the computer module, and various software components and techniques.

The sequence of tones is created by sending digital values to the DAC that generate a pseudo sign wave. It is not intended to simulate a musical scale. However, the tone frequencies do span the nominal audio frequency range of the modulator/transmitter string so they can be used to measure frequency response of the spacecraft hardware.

While DOVE may not sound much different to listeners, hardware components never before activated are in use, along with new software techniques essential to the full exercise of DOVE's capabilities. It is worth noting that some of the hardware used in this test has been idle for 4 1/2 years in space, yet worked perfectly the first time.

With this critical test successfully completed, the development and operations team expects continue to expand DOVE's capabilities.

[The AMSAT News Service would like to thank WD0E and the DOVE Team for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-232.02
PHASE-3D INTEGRATION IN ORLANDO

HR AMSAT NEWS SERVICE BULLETIN 232.02 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 20, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-232.02

PHASE-3D Spacecraft Integration To Has Begun

Dick Jansson, AMSAT-NA's Vice President for Engineering, announces that progress preparing the Phase 3D spaceframe to receive its various modules is progressing well. He adds that one of the recent factors which greatly assisted this progress was the visit of Konrad Mueller DG7FDQ to the Orlando, Florida Integration Facility. Dick said that Konrad was a tireless worker during his short stay in Orlando, not getting any time to visit the beach or even Disney World. Those American "slave drivers" kept his attention glued to the Phase-3D task, Jansson commented. One of the last of the tasks completed, before departing for the airport for his trip home, was the bonding of final two equipment panels and heat pipes to the main structure.

AMSAT-NA President Bill Tynan (W3XO) comments that we greatly appreciate the corporation of AMSAT-DL in loaning Konrad Mueller to us so that this vital work could be accomplished in record time and with the high quality required in the construction of the Phase-3D satellite.

/EX
SB SAT @ AMSAT $ANS-232.03
PHASE-3D PRESENTATIONS AT SURREY

HR AMSAT NEWS SERVICE BULLETIN 232.03 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 20, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-232.03

Phase 3D Presentations at the Surrey Satellite Conference

Last week's ANS bulletins presented summaries of some of the papers presented at the International Amateur Satellite Conference held at the University of Surrey in England between July 29 and August 1. This week's bulletin includes more of the material presented on Phase-3D.

One interesting features presented on Phase-3D was in a paper by Dr. Karl Meinzer DJ4ZC and read by Peter Guelzow (DB2OS). It concerned the "LEILA". LEILA is a German acronym but basically it is an "anti-alligator device." LEILA is designed to seek out extra strong signals in the passband. It will initially transmit a Morse warning to the offender telling him or her to reduce power. If that goes unheeded, it will insert 18 dB of attenuation on the frequency of the offending signal. It was stated that LEILA will be able to handle up to five such notches simultaneously.

Peter also discussed the two RUDAKs computer planned for Phase 3D-RUDAK-E and RUDAK-U. The "E" stands for experimental and the "U" for users. RUDAK-U will use AX25 pacsat protocols with six uplinks and one or two down-links at 1200 and 9600 bps, and perhaps faster. The ramdisk should be 16 to 32 MBits. A mailbox is expected. RUDAK-E, similar to the computer on

AO-21, and is intended to support experiments with DSP front-ends for software modems at low and medium speeds such as 1200, 9600 and 19200 bps. Also on the cards is a regenerative modem faster than 64 Kbps and possibly one modem at about 500 Kbps. This will probably use 2400 MHz for one of the links and require 10 Watts of output from P3D and a 1 meter dish for the ground user.

In his talk, G6GEJ presented details on the 2M transmitter he has been building for Phase-3D. It is designed to operate from the 10.7 MHz I.F and uses conventional linear amplification. Mike impressed the group with the prototype of the unit, which he displayed at the meeting.

Hans van Groenendaal ZS5AKV described the 10 meter transmitter being designed and built in South Africa. It will use Compatible Amplitude Modulation (CAM) so that it can be received on simple short wave radios. Transmissions are to consist of 15 minutes of digitally generated audio. The system is intended mainly for educational purposes. It was noted that test transmissions from ZS6SRL using CAM can be heard on 10.125 MHz at 0800 UTC and 1700 UTC Mondays. The signal is beamed toward Europe.

/EX
SB SAT @ AMSAT $ANS-232.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 232.04 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 20, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-232.04

Weekly OSCAR Status Reports: 20-AUG-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
==========
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize

the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.

==========

[G3RUH/DB2OS/VK5AGR]

RS-10: NO1R has been enjoying RS-10's Mode A operation at his QTH near Boston. On several mid-Atlantic passes he has worked and confirmed G3ASM in grid square IO94 and F9HR in grid square JN18 near Paris. Robert (F9HR), appears to be very active and NO1R has heard him on both morning and evening passes. Last week, DH5ROB/TF, answered his CQ from Iceland. NO1R used to pass up these low angle mid-Atlantic passes, but now he has worked some of of his best DX on these passes. NO1R also adds that all these DX contacts were done using CW. [NO1R]

AO-16: AO-16 is up and running well. [WH6I]

KO-25: WH6I reports that KO-25 is up and running. He is having some trouble getting reliable data from it, however, and can't seem to find the problem. It's either in the bird, or he feels that he has got some new local interference on the downlink frequency. He is still checking. [WH6I]

KO-23: KO-23 On-Board-Computer (OBC) software crashed about one week ago. The engineers at the KAIST are currently downloading memory images for debugging purposes. Software reloading and packet service will not be carried out until the code dump process finished, which hopefully be completed by next Tuesday. [Hyungshin Kim (hskim@casaturn.kaist.ac.kr)]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1316. AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-21 17:29:42 UTC
From: ianheng@merlion.singnet.com.sg
Message-ID: <3382u6$j0b@merlion.singnet.com.sg>
Source record: 27019

Dear Readers

Could someone please give me the information for subscribing to articles
from AMSAT.org . Thank you.

Your help is much appreciated.

Best regards
Ian Heng
9V1XA

1317. Yaesu 2 Meter All-Mode for Sale

Newsgroup: rec.radio.amateur.space
Date: 1994-08-22 14:54:25 UTC
From: brunelli_pc@delphi.com
Message-ID: <Jcyx1rB.brunelli_pc@delphi.com>
Source record: 27021

FOR SALE:

Yaesu FT-290 RII 2 Meter All-Mode Transceiver
- DTMF Microphone
- 25 Watt Amplifier
- Mobile Mounting Bracket (never installed)

This rig is in perfect condition. I purchased it for
the Spring VHF Sweeps and have used it about 6 times
since then. The receiver section and audio on this
rig are excellent, and the SSB is exceptionally sweet.

Unfortunately I must part with it for financial reasons.

The first $450 takes it away.

respond via Email to brunelli_pc@delphi.com

pete brunelli
n1qdq

1318. UoSAT-3

Newsgroup: rec.radio.amateur.space
Date: 1994-08-22 17:31:56 UTC
From: ae517@FreeNet.Carleton.CA
Message-ID: <Cuy618.LM2@freenet.carleton.ca>
Source record: 27022

Low Earth Orbit Satellite System used in Voyage to
North Pole - US/Canada Arctic Ocean Section '94

Today, August 22nd, 1994, the USCG icebreaker POLAR SEA and the
Canadian CG icebreaker LOUIS S. ST-LAURENT, in conjunction with
the Arctic Ocean Section 1994, succeeded in reaching the geographic
north pole.

The voyage was conceived to provide support to a joint US/Canada
environmental and scientific research program in the Arctic Ocean.
The project involves over 60 scientists studying the role of the Arctic
Ocean in relation to changes in regional and global climate and
environment. The two vessels left the Chukchi Sea in late July,
through areas of the Arctic Ocean that never before had been transited
by ship due to the severe sea ice regimes found there.

A number of systems were used in providing communications support
to the Canadian icebreaker ST-LAURENT, including a 56Kbp/s
INMARSAT link. However, after moving outside of the INMARSAT
Pacific Ocean Region satellite footprint at approximately 80 degrees
latitude north, it was UoSAT 3 that provided the primary means of
transferring ice imagery files so critical to ice navigation. Radio
Amateurs will remember UoSAT 3 as UO-14 when it was operated in
the Amateur service, where this technology was largely pioneered. We
believe this to be the first shipboard application of LEO store-and-
forward communications in an operational scenario.

The Canadian Coast Guard would like to thank the Canadian Centre
for Marine Communications in St. John's Newfoundland, as well as
SatelLife of Cambridge, Mass., the Telemedicine Centre of Memorial
University of Newfoundland, and the Centre for Satellite Engineering
Research of the University of Surrey, U.K. for their support in this
program.

tnx de va3rr@amsat.org
Canadian Coast Guard

1319. Portable EME Station -- Questions

Newsgroup: rec.radio.amateur.space
Date: 1994-08-22 21:39:04 UTC
From: btoback@netcom.com
Message-ID: <btobackCuyHH5.Hw4@netcom.com>
Source record: 27023
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.homebrew

I hope that one of these will be the correct newsgroup for this question; advice on redirection is welcome.

I'm thinking of assembling a portable EME station that I could use for demonstrations at schools. I don't know if such a thing is possible at any reasonable cost, or for any reasonable definition of "portable." But here are the questions anyway:

1. I assume that because of my Arizona location, I can't use 432MHz. This seemed to be the best compromise between power amplifier practicality and antenna size. Is 23cm a good second choice?

2. Assuming that 23cm is a good second choice, how can I generate the necessary power on that band? I've found one amplifier design, in the 1975 (!) ARRL Handbook. It uses a pair of 3CX100A5 tubes and could be used for 200W continuous or 400W intermittent. Since the antenna will be compromised for portability's sake (no 24-ft dishes), I'd like to get more power than this. Has the state of the art improved since 1975? If so, where can I find construction information?

3. Various publications have stated that Yagi designs have proven unsatisfactory for EME work at 23cm, but don't say why. I can make guesses (losses in the splitter network, etc.), but don't know for sure. Is it in fact possible to use these for 23cm EME work? A back-of-the-envelope calculation suggests that a 24dBi array could be quite practical, but I haven't considered splitter network losses.

4. If a Yagi array really can't be made practical, does anyone know of some portable dish designs -- 4m or so? The dish doesn't have to be rugged or able to stand up to weather since it will never see a permanent installation.

The objective is a station that can hear its own echoes -- not necessarily with communication-capable quality -- and can communicate with a "big gun" EME station. If my planning is going in a completely fruitless direction for such an objective, I'd like to know early on!

Thanks,
-- Bruce Toback
KN6MN

1320. Northeast Space Development Conference

Newsgroup: rec.radio.amateur.space
Date: 1994-08-22 21:54:52 UTC
From: ai181@freenet.buffalo.edu
Message-ID: <CuyI7H.E0z@freenet.buffalo.edu>
Source record: 27024

YOU ARE INVITED TO THE PREMIER SPACE CONFERENCE EVENT
IN THE NORTHEAST FOR FALL 1994!

The Northeast Space Development Conference is scheduled for Saturday, September 24, 1994. It will be held on the campus of Rensselaer Polytechnic Institute (RPI) in Troy, New York. The Rensselaer Space Society is sponsoring the use of campus facilities and meeting amphitheaters. Seating for up to 300 persons is available for conference sessions and exhibits will be setup in an adjacent, public access display hall. Propulsion hardware, literature and other items of interest will be shown including displays covering high power and experimental rocketry. Other sponsors of the conference are the National Space Society and its Northeast Chapters, the International Space University, ETM/Solar Works and Space Delivery Systems.

The theme of this conference will be:
"PROGRESS IN COMMERCIAL SPACE DEVELOPMENT"

The Northeast Space Development Conference's primary goal is to offer a meeting place for people from aerospace companies, universities, organizations, government agencies and other individuals who either contribute, participate or otherwise support Commercial Space Development in the Northeast region and across the United States and Canada. We hope to do our part in the Northeast to assure the continued growth of the Commercial Space Industry by offering a highly visible, technical and business level forum to try and focus more regional and national media attention on commercial space endeavors. We feel it is critical to encourage new commercial space ventures and partnerships. This unique conference will hopefully spawn new business and academic relationships, and provide information on the opportunities for cooperation between established and newer space businesses.

We are looking forward to having you become a regular participant in the Northeast Space Development Conference.

NORTHEAST SPACE DEVELOPMENT CONFERENCE - NSDC '94
Darrin Communications Center, Rensselaer Polytechnic Institute, Troy,NY
PROGRAM, SPEAKERS, TIMES (VER. 1.2)

September 24, 1994

REGISTRATION - (8:00am-9:00am)
Continental Breakfast - Display Hall/Lounge Area (until 8:50am)

INTRODUCTION - (8:55am-9:00am)
Conference Chair - Chris Welty

KEYNOTE ADDRESS - (9:00am-9:30am)

PROGRESS IN COMMERCIAL SPACE DEVELOPMENT
Keynote Speaker - Robert Walker, Rep. - PA *

SESSION I - (9:30am-10:30am)

TECHNOLOGY ACCESS & PAYLOAD PROTECTION
- Al Halstead, Introductions
NASA's Technology Reinvestment Program
- Glenn Wright, NASA OACT/CTC *
Satellite & Launch Insurance Update
- Jeffrey S. Cassidy, US Aviation Underwriters

SESSION II - (11:00am-12:00pm)

SMALL LAUNCH VEHICLES & NEW LAUNCH OPTIONS
- Dean Oberg, Introductions
Hot Topics: Launch Vehicle Options (LLV, SS-25, Orbex)
- Peter Diamandis, CTA, Inc.
Space Access by Conversion: New Solid Propellant Launchers
- Robert Davis, E'Prime Aerospace Corp. *

LUNCHEON - (12:30pm-1:30pm) (Chris Welty - Introductions)

Luncheon Talk - PROGRESS IN SPACE BUSINESS EDUCATION
Luncheon Speaker - Robert Richards, International Space University

SESSION III - (2:00pm-3:00pm)

EXPERIMENT CARRIERS & MICROGRAVITY RESEARCH
- Al Halstead, Introductions
Spacehab Progress: Docking Missions to MIR
- David Rossi, Spacehab, Inc.
Progress in Biotechnology & Crystal Growth Research in Space
- Wesley Hymer, PennState University

SESSION IV - (3:30pm-4:30pm)

PROPULSION SYSTEMS & SOLO SPACEFLIGHT
- Dean Oberg, Introductions
Rocket Propulsion Progress - Hybrid Technology Option Project
- Brian Hughes, AMROC, Takoma Park, MD Office *
SPACECUB: A One Passenger Sub-Orbital Rocket
- Geoffrey A. Landis, NASA Lewis Research Center
and David Burkhead, University of Akron

SESSION V - (5:00pm-6:00pm)

SUNSAT ENERGY & LUNAR COMMERCE
- Gay Canough, Introductions
Progress in Solar Power Satellites
- Seth Potter, New York University *
Commercial Lunar Rover - Advanced Robotics
- David Gump, LunaCorp, Arlington, VA

* invited

SPACE ENTREPRENEURS POST CONFERENCE DINNER

As a follow-on function a cocktail half hour and a dinner gathering will be held at the Castaways Restaurant which is across the street from the Super 8 Motel (close to RPI).

COCKTAILS - (6:30pm-7:00pm)
- Cash Bar & opportunity to visit and socialize with other attendees, associates and speakers
INFORMAL "Dutch Treat" DINNER - (7:00pm-?)
- Fine food and discussion of the days events.

NSDC '94 - REGISTRATION FORM

NAME _____

ADDRESS _____

CITY _____ ST ___ ZIP _____

PHONE _____ - _____ - _____

____ Regular $85 (After 9/1, at door)

____ Advance $65 (Before 9/1, NSS, AIAA, Tripoli, NAR)

____ Student with ID $20

(Fees include Luncheon)

Make Check or MO payable to NSDC. Print and mail this form and registration fee to:

NSDC c/o Rensselaer Space Society
RPI
Rensselaer Union, PO Box 86
Troy, NY 12180

For more info:
Call (607) 785-6499
or e-mail to canough@bingvaxa.cc.binghamton.edu

Hotels -

Super 8 (near RPI) 800-800-8000 $48-$55/night
Holiday Inn (US 9, 8 mi. S. of Troy) 800-465-4329 $67/night

The Desmond (near Albany Airport) 800-448-3500 $119-$131/night
Marriott Inn (near Albany Airport) 800-228-9290 $129-$168/night
(Rates as of 8/19/94, NSDC not responsible for rate changes)

--
(Dean R. Oberg)

1321. Re: Homebrew Global Positioning System (GPS)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-23 05:25:00 UTC
From: rmk@hit.sb.sub.de
Message-ID: <5VOK33dbAkB@hit42.hit.sb.sub.de>
Source record: 27041
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc,rec.radio.amateur.homebrew

Hello from Germany!
The Rockwell Comany offers for about 800 DM - 1500 DM GPS-Modules for
customized applications. The modules have a RS232 interface.

Rainer M. Kreten

--

CrossPoint v3.0 R

1322. Re: Satellite tracking and Mean Anomaly

Newsgroup: rec.radio.amateur.space
Date: 1994-08-23 18:36:18 UTC
From: johnsotc@sd2.af.mil
Message-ID: <1994Aug23.183618.13686@afit.af.mil>
Source record: 27025

In article <3317jp$443@aggedor.rmit.EDU.AU>, david@pitvax.xx.rmit.edu.au writes:
|> I have been using PCTrack 3 as my first tracking program and find it
|> useful and accurate but it doesn't tell me anything about mean anomaly
|> (MA). I see from the AMSAT Bulletins that AO-13 for example has various
|> transponder schedules depending on where it is in its orbit from perigee.
|>
|> I'm wondering if there is an easy way to relate MA to UTC for a particular
|> bird? Or do 'better' tracking programs track MA as well as position/footprint?
|> What about the programs sold by AMSAT? I'm not a member of AMSAT-Aust. yet
|> but have the information and plan to sbscribe soon.
|>
|> David VK3JKP

David

PC-Track displays the current phase (mean anomaly normalized to 256) in the
text tracking mode (View | Track (text)) or the F2 key from the main screen.

Tom Johnson
Author of PC-Track

1323. Motorola HT's WANTED!!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-08-24 02:19:00 UTC
From: darryl.linkow@ledge.com
Message-ID: <898744B.01E900040E.uuout@ledge.com>
Source record: 27027

8/23/94
Hello all! I am in IMMEDIATE NEED of some Motorola
walkie-talkies. I am looking for either Motorola HT-600,
MT-1000, or Motorola Radius P200 units. They must be 5 Watt
units and have at least 6 channels and must cover the 157-174 Mhz.
range. I am also interested in accesories for these units, such as
speaker/microphones, headsets, etc. Let me know what you have.
WILL PAY CASH or can trade for hardware and/or software items
from my ads. Leave message here or give me a call.
Darryl Linkow
(818) 346-5278 9 am - 5 pm PDT
(The VERY BEST time to reach me is ANY MORNING right at 9 am PDT)

---
* OLX 2.2 * Darryl Linkow (818)346-5278 9 am - 5 pm PDT

1324. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-24 08:21:00 UTC
From: POSTMAST@PLEARN.EDU.PL
Message-ID: <199408240821.BAA24412@ucsd.edu>
Source record: 27026

```
HELO SEARN.SUNET.SE
MAIL FROM:<owner-ham-space@UCSD.EDU>
RCPT TO:<bulgar@PLEARN.BITNET>
DATA
Received: from SEARN (NJE origin SMTPF@SEARN) by SEARN.SUNET.SE (LMail
V1.2a/1.8a) with BSMTP id 9588; Fri, 19 Aug 1994 14:33:45 +0200
Received: from ucsd.edu by SEARN.SUNET.SE (IBM VM SMTP V2R2) with TCP;
Fri, 19 Aug 94 14:33:41 +0200
Received: by ucsd.edu; id EAA20744
sendmail 8.6.9/UCSD-2.2-sun
Fri, 19 Aug 1994 04:30:45 -0700 for ham-space-list
Errors-To: ham-space-relay@UCSD.EDU
Sender: ham-space-relay@UCSD.EDU
Precedence: List
Received: by ucsd.edu; id EAA20738
sendmail 8.6.9/UCSD-2.2-sun
Fri, 19 Aug 1994 04:30:41 -0700 for ham-space-ddist
Message-Id: <199408191130.EAA20738@ucsd.edu>
Date: Fri, 19 Aug 94 04:30:40 PDT
From: Ham-Space Mailing List and Newsgroup <ham-space@UCSD.EDU>
Errors-To: Ham-Space-Errors@UCSD.EDU
Reply-To: Ham-Space@UCSD.EDU
Precedence: Bulk
Subject: Ham-Space Digest V94 #230
To: Ham-Space@UCSD.EDU

----------------------------Original message----------------------------

Ham-Space Digest Fri, 19 Aug 94 Volume 94 : Issue 230

Today's Topics:
Address for KC0TO/7 in Wyoming
Kantronics KPC-9612
Need 9600 baud mod info for IC271/471
New satellite Windows programs
STS-68 - SAREX?

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
```

policies or positions of any party. Your mileage may vary. So there.

Date: 18 Aug 1994 12:47:05 -0500
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!swrinde!pirates.cs.swt.edu!cs.utexas.edu!not-for-mail@network.ucsd.edu
Subject: Address for KC0TO/7 in Wyoming
To: ham-space@ucsd.edu

My first AO-13 contact was with KC0TO/7 in Wyoming on 30 July at 0607 UTC.

He gave the QSL route, but I misplaced it.
My card to the callbook address for KC0TO was returned undeliverable.

Does anyone have the correct QSL route?

-- Wayne Estes WD5FFH Wayne_Estes@csg.mot.com

Date: 18 Aug 1994 18:05:35 GMT
From:
agate!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!zip.eecs.umich.edu!yeshua.marcam.com!charnel.ecst.csuchico.edu!psgrain!news.tek.com!gv-gate.gvg.@@ihnp4.ucsd.edu
Subject: Kantronics KPC-9612
To: ham-space@ucsd.edu

Does anyone know if the new Kantronics KPC-9612 dual speed TNC can be
used to communicate with the 9600 baud satellites?

Randy
WA2AGE

Date: Thu, 18 Aug 94 13:33:11 PDT
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!europa.eng.gtefsd.com!uhog.mit.edu!news.kei.com!ssd.intel.com!chnews!news@network.ucsd.edu
Subject: Need 9600 baud mod info for IC271/471
To: ham-space@ucsd.edu

Im looking for 9600 baud modification info for the ICOM 271 & 471.

Thanks & 73s,
Tom WB7ASR...

Date: Thu, 18 Aug 94 13:10:16 PDT
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!europa.eng.gtefsd.com!uhog.mit.edu!news.kei.com!ssd.intel.com!chnews!news@network.ucsd.edu

Subject: New satellite Windows programs
To: ham-space@ucsd.edu

I just received my copy of the July/August 1994 issue of THE AMSAT JOURNAL.
In the journal, pages 6-9, they talk about a new Windows PB and PG like
program by ZL2TPO. The program also has a fully intergrated color graphic
world map showing satallite positions and foot prints. It has full support
for the Kansas City Tracker/Tuner, with the optional Windows program by
KC6WYG, on page 10.

Both programs can be purchased from AMSAT direct for $40.00 @ 301-589-6062
All proceeds go to the Phase3D program.

73s, Tom WB7ASR...

Date: Wed, 17 Aug 1994 20:25:03 -0400
From:
news.cerf.net!bengal.oxy.edu!acsc.com!gopher.sdsc.edu!nic-nac.CSU.net!charnel.ec
st.csuchico.edu!yeshua.marcam.com!news.kei.com!eff!news.umbc.edu!haven.umd.edu!c
s.umd.@ihnp4.ucsd.edu
Subject: STS-68 - SAREX?
To: ham-space@ucsd.edu

In article <32t4l9$ee1@fozzy.aud.alcatel.com>, rjgrocho@aud.alcatel.com wrote:

> I haven't yet seen anything that sez STS-68 will be a SAREX mission.
> Is it? Tnx.
>
> Robert - N5UPF

STS-64 is the next SAREX mission. Due for launch Sept 9 nominally

Jim Blackwell, N3KWU

Date: 18 Aug 1994 02:10:29 GMT
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!europa.eng.gtefsd.com
!news.umbc.edu!rkirk1@network.ucsd.edu
To: ham-space@ucsd.edu

References <32bqoe$ur@eis.calstate.edu>, <32ggg8$hsh@hollywood.cinenet.net>,
<1994Aug13.082514.868@ke4zv.atl.ga.us>.umbc.ed
Subject : Re: Homebrew Global Positioning System (GPS)

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
: In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net
(Mark Austin) writes:
: >
: >I had an idea. How about linking up a GPS with a cellular phone and
: >a large battery to power both for a couple of days. Then dial a number

: >on the cellular where you want the GPS to send it's location info and
: >drop the whole bundle into someone's car. Since GPS info can be used
: >with several very cheap street mapping systems (Delorme for one) you'll
: >be able to sit at home and watch them driving down the street on
: >your home computer. Should be able to do this cheap. A couple of
: >hundred dollars (with cheap GPS and cheap phone). I have no ideas
: >on keeping cellular costs down though. One thought would be to set
: >the phone to answer and power up the whole gizmo and then shut down
: >after a call is placed into it. You wouldn't get a continuous
: >signal but you'd be able to find where someone is on demand (if they're
: >within cellular calling range). Such a setup could last for a LONG
: >time with the proper battery.

: You aren't going to be able to get a GPS and cell phone for a couple
: hundred dollars. The cheapest GPS receivers are around $400, and so
: are cell phones unless you roll their cost into a long term service
: contract. And monthly and per minute cell phone charges will mount
: up fairly rapidly. By using packet radio, amateur or commercial,
: you can send position updates on a regular basis without incurring
: quite as much cost.

: DeLorme Mapping and City Streets are a couple of commercial map
: systems that work with GPS. However, APRS (Automatic Packet Reporting
: System) is in some ways better. While it lacks the friendly user
: interface of the commercial products, and it's pre-made map databases
: are skimpy, you can make your own maps, and it works with local and
: remote GPS receivers (using packet UI frames for the latter). It also
: supports other information about the remote sites such as range and
: bearing data from DF equipment, and arbitary text messages.

: However, what many of us want is *differential* GPS. The Coast Guard,
: FAA, and others send out position deltas from a fixed benchmark
: receiver that are received and used to correct the reading of the local
: GPS receiver. These transmissions are either at MF or VHF depending on
: the system. A special receiver is required, and either a GPS receiver
: designed to work with differential signals, or a PC that can take the
: timestamped position reports and reconcile them via software, is used
: to give a true position. This method removes the deliberate SA jitter,
: and other error sources such as varying atmospheric propagation factors,
: from the position data. This allows much greater precision in determining
: location than raw GPS alone.

: It would be nice if the APRS author would support this mode in his
: software. Some of us are willing to set up benchmark receivers on
: the amateur bands. That timestamped data could be used to correct
: the positions reported by the rover receivers over packet.

: Gary
: --
: Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
: Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
: 534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary

: Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

This has already been done on an experimental basis here in the Annaoplis area: A cooperating ham otransmits a differential signal on the same freq as the APRS net. Receive it thru your TNC and it goes into the GPS receiver. Works fine.

(Wierd trouble with a missing letter - regrets)

Bob
ht os

End of Ham-Space Digest V94 #230
****
.
QUIT

1325. Re: satellite tracking for X?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-24 12:58:44 UTC
From: mklee@actrix.gen.nz
Message-ID: <Cv1Ipx.MH6@actrix.gen.nz>
Source record: 27028

In article <jeppe.777350906@zetor.clinet.fi>,
Joachim Paganus <jeppe@clinet.fi> wrote:
> Does anyone know if there is a satellite tracking program for X-windows
> that shows the satellite and its coverage over a map in real-time?
> (Like Traksat, STS+ and zillions of other tracking programs for dos)

In a recent rec.radio.amateur.space article Tom
(tom_boza@ccm.hf.intel.com) wrote about an article in the July/August
issue of THE AMSAT JOURNAL, in which it talked about a Windows prog. It
has full support for the Kansas City tracker/tuner , wtc, wtc.

Windows PB and PG can be purchased from AMSAT direct for $40.00 @
301-589-6062. All proceeds go to the Phase3D program.

Hope this helps.

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

1326. Yaesu Ft-736 Mods or undocumented features?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-24 21:17:34 UTC
From: mmjjmm@post.its.mcw.edu
Message-ID: <33gdde$ml7@post.its.mcw.edu>
Source record: 27030

I recently acquired a Yaesu FT-736 and would like to get information on mods or undocumented features that may be available.

--
Michael J. Malloy Amateur Radio N9WJV
Medical College of Wisconsin Compuserve 70334,3563
Milwaukee, Wisconsin Internet mmjjmm@post.its.mcw.edu

1327. Re: Question on AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-08-24 21:21:46 UTC
From: little@iamu.chi.dec.com
Message-ID: <33gdla$hto@nntpd.lkg.dec.com>
Source record: 27031

In article <325m1p$clc@chnews.intel.com>, Tom WB7ASR <tom_boza@ccm.hf.intel.com> writes:
|>
|>In article <1994Aug8.013435.21380@auc.trw.com>, <etuggle@auc.trw.com> writes:
|>>
|>> Does anyone have any experience working AO-21 with a vertical? If so
|>> how much power should I expect it to take? Anyone using the dual band
|>> J-Pole from the ARRL handbook inside an attic?
|>>
|>
|>You most likley will never be able to work through AO-21 with 20 watts and
|>a vertical/J-pole. You will need at least 100+ watts into a 40+ ele yagi.
|>The only reason you need this type of station is because that is what others
|>are using. Those stations will caputre the birds input, thus you will never
|>be heard. Its a shame, because 20 watts with a vertical is really all you need.
|>
|>Tom WB7ASR...
|>

I think that is a slight overstatement. Mobiles get in on a regular basis
and few if any are running 40+ elements. On the other hand, you are correct
that if the others won't stand by to let you in, you won't capture the
satellite's receiver. This is an unfortuante case on the satellites where
the big gun always wins.

73,
Todd
N9MWB

1328. KIDS AND SPACE

Newsgroup: rec.radio.amateur.space
Date: 1994-08-24 23:27:20 UTC
From: swteegar@winward.win.net
Message-ID: <257@winward.win.net>
Source record: 27029

Greetings one and all....

A year ago when I was busy doing the SAREX thing in Hawaii, I wrote this "Story" of sorts. I write a fair amount, but this one seemed to be accepted by alot of people in education and in the Space Program. I thought I'd share it with all of you in hopes that it inspires you to think about Space and Kids and what maybe YOU can do to help...

Comments are always welcome as are thoughts on what more we can do as hams (And non Hams) to inspire kids to dream about space and the "Big Picture"....

Aloha,

Steve W. Teegarden
WH6IC

****
SPACE...

In the travels of my life, I have enjoyed walking the quiet sands of Time, and seeing the beauty of crystal clear water as it slowly builds to a wave,then to a horizon, then to a world of oceans.....

I have heard the sounds of Canadian geese as they navigate to the warmer regions of our world flying only by instinct and god's gift of flight....

I have spoken in quiet words to those that could not speak, and I have listened to their sounds, that only the soul can hear...

But I have never seen a sight like that of a child's face when the only sounds are stars from the distance galaxies above and the glowing of planets smiling down on earth...

Alas, I have found a way in my life to show others
the vision of what I see.... and to help them hear those sounds that only the mind can understand....

I have had the chance to see this child look into the vast depths of space and ask only one thing......

Can you teach me ?

12-JULY-1993

An inspiration to us all, this vision of a child
as they look into the heavens.May we never forget
that teaching is in fact the extension of the spirit
to go beyond that which do not understand .....

Steve W. Teegarden

SPACE...

1329. Re: satellite tracking for X?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-25 04:34:58 UTC
From: dantodd@wheel.ucdavis.edu
Message-ID: <Cv2q2A.6Mn@ucdavis.edu>
Source record: 27032

Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
: In article <jeppe.777350906@zetor.clinet.fi>,
: Joachim Paganus <jeppe@clinet.fi> wrote:
: > Does anyone know if there is a satellite tracking program for X-windows
: > that shows the satellite and its coverage over a map in real-time?
: > (Like Traksat, STS+ and zillions of other tracking programs for dos)

: In a recent rec.radio.amateur.space article Tom
: (tom_boza@ccm.hf.intel.com) wrote about an article in the July/August
: issue of THE AMSAT JOURNAL, in which it talked about a Windows prog. It
: has full support for the Kansas City tracker/tuner , wtc, wtc.

Perhaps Joachim's use of the plural confused you. X-window is the(a)
windowing system to allow gui manipulation of Unix processes. It also has
a number of widgets which can be used to create graphical programs etc. I
too would be interested in finding sat-tracking software for X as well as
software that will compile and run under Linux (I'm pretty new to Unix
administration, compiling etc. so binaries are best :-)

Thanks,
dan
--
--
* Daniel D. Todd KC6UUD WWW Publisher *
* dantodd@wheel.ucdavis.edu http://wheel.ucdavis.edu *
* msmosaic@wheel.ucdavis.edu (WWW stuff) http://www.ucdavis.edu *
--
* The Woodstock '94 motto: *
* Tune in, Turn on, ... Sell out. *
* comedy central *
--

1330. Re: AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-08-25 05:01:38 UTC
From: dinga@lightside.com
Message-ID: <33h8ji$oab@covina.lightside.com>
Source record: 27033

In article <3382u6$j0b@merlion.singnet.com.sg>,
ianheng@merlion.singnet.com.sg (Ian Heng 9V1XA) says:
>
>Dear Readers
>
>Could someone please give me the information for subscribing to articles
>from AMSAT.org . Thank you.
>
>Your help is much appreciated.
>
>Best regards
>Ian Heng
>9V1XA
>
Send E-mail to listserv@amsat.org
"subscribe amsat-bb"

73's

1331. (none)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-25 11:17:53 UTC
From: POSTMAST@PLEARN.EDU.PL
Message-ID: <199408251117.EAA22684@ucsd.edu>
Source record: 27035

```
HELO SEARN.SUNET.SE
MAIL FROM:<owner-ham-space@UCSD.EDU>
RCPT TO:<bulgar@PLEARN.BITNET>
DATA
Received: from SEARN (NJE origin SMTPF@SEARN) by SEARN.SUNET.SE (LMail
V1.2a/1.8a) with BSMTP id 9588; Fri, 19 Aug 1994 14:33:45 +0200
Received: from ucsd.edu by SEARN.SUNET.SE (IBM VM SMTP V2R2) with TCP;
Fri, 19 Aug 94 14:33:41 +0200
Received: by ucsd.edu; id EAA20744
sendmail 8.6.9/UCSD-2.2-sun
Fri, 19 Aug 1994 04:30:45 -0700 for ham-space-list
Errors-To: ham-space-relay@UCSD.EDU
Sender: ham-space-relay@UCSD.EDU
Precedence: List
Received: by ucsd.edu; id EAA20738
sendmail 8.6.9/UCSD-2.2-sun
Fri, 19 Aug 1994 04:30:41 -0700 for ham-space-ddist
Message-Id: <199408191130.EAA20738@ucsd.edu>
Date: Fri, 19 Aug 94 04:30:40 PDT
From: Ham-Space Mailing List and Newsgroup <ham-space@UCSD.EDU>
Errors-To: Ham-Space-Errors@UCSD.EDU
Reply-To: Ham-Space@UCSD.EDU
Precedence: Bulk
Subject: Ham-Space Digest V94 #230
To: Ham-Space@UCSD.EDU

----------------------------Original message----------------------------

Ham-Space Digest Fri, 19 Aug 94 Volume 94 : Issue 230

Today's Topics:
Address for KC0TO/7 in Wyoming
Kantronics KPC-9612
Need 9600 baud mod info for IC271/471
New satellite Windows programs
STS-68 - SAREX?

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
```

policies or positions of any party. Your mileage may vary. So there.

Date: 18 Aug 1994 12:47:05 -0500
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!swrinde!pirates.cs.swt.edu!cs.utexas.edu!not-for-mail@network.ucsd.edu
Subject: Address for KC0TO/7 in Wyoming
To: ham-space@ucsd.edu

My first AO-13 contact was with KC0TO/7 in Wyoming on 30 July at 0607 UTC.

He gave the QSL route, but I misplaced it.
My card to the callbook address for KC0TO was returned undeliverable.

Does anyone have the correct QSL route?

-- Wayne Estes WD5FFH Wayne_Estes@csg.mot.com

Date: 18 Aug 1994 18:05:35 GMT
From:
agate!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!zip.eecs.umich.edu!yeshua.marcam.com!charnel.ecst.csuchico.edu!psgrain!news.tek.com!gv-gate.gvg.@@ihnp4.ucsd.edu
Subject: Kantronics KPC-9612
To: ham-space@ucsd.edu

Does anyone know if the new Kantronics KPC-9612 dual speed TNC can be
used to communicate with the 9600 baud satellites?

Randy
WA2AGE

Date: Thu, 18 Aug 94 13:33:11 PDT
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!europa.eng.gtefsd.com!uhog.mit.edu!news.kei.com!ssd.intel.com!chnews!news@network.ucsd.edu
Subject: Need 9600 baud mod info for IC271/471
To: ham-space@ucsd.edu

Im looking for 9600 baud modification info for the ICOM 271 & 471.

Thanks & 73s,
Tom WB7ASR...

Date: Thu, 18 Aug 94 13:10:16 PDT
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!europa.eng.gtefsd.com!uhog.mit.edu!news.kei.com!ssd.intel.com!chnews!news@network.ucsd.edu

Subject: New satellite Windows programs
To: ham-space@ucsd.edu

I just received my copy of the July/August 1994 issue of THE AMSAT JOURNAL.
In the journal, pages 6-9, they talk about a new Windows PB and PG like
program by ZL2TPO. The program also has a fully intergrated color graphic
world map showing satallite positions and foot prints. It has full support
for the Kansas City Tracker/Tuner, with the optional Windows program by
KC6WYG, on page 10.

Both programs can be purchased from AMSAT direct for $40.00 @ 301-589-6062
All proceeds go to the Phase3D program.

73s, Tom WB7ASR...

Date: Wed, 17 Aug 1994 20:25:03 -0400
From:
news.cerf.net!bengal.oxy.edu!acsc.com!gopher.sdsc.edu!nic-nac.CSU.net!charnel.ec
st.csuchico.edu!yeshua.marcam.com!news.kei.com!eff!news.umbc.edu!haven.umd.edu!c
s.umd.@ihnp4.ucsd.edu
Subject: STS-68 - SAREX?
To: ham-space@ucsd.edu

In article <32t4l9$ee1@fozzy.aud.alcatel.com>, rjgrocho@aud.alcatel.com wrote:

> I haven't yet seen anything that sez STS-68 will be a SAREX mission.
> Is it? Tnx.
>
> Robert - N5UPF

STS-64 is the next SAREX mission. Due for launch Sept 9 nominally

Jim Blackwell, N3KWU

Date: 18 Aug 1994 02:10:29 GMT
From:
ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!europa.eng.gtefsd.com
!news.umbc.edu!rkirk1@network.ucsd.edu
To: ham-space@ucsd.edu

References <32bqoe$ur@eis.calstate.edu>, <32ggg8$hsh@hollywood.cinenet.net>,
<1994Aug13.082514.868@ke4zv.atl.ga.us>.umbc.ed
Subject : Re: Homebrew Global Positioning System (GPS)

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
: In article <32ggg8$hsh@hollywood.cinenet.net> maustin@hollywood.cinenet.net
(Mark Austin) writes:
: >
: >I had an idea. How about linking up a GPS with a cellular phone and
: >a large battery to power both for a couple of days. Then dial a number

: >on the cellular where you want the GPS to send it's location info and
: >drop the whole bundle into someone's car. Since GPS info can be used
: >with several very cheap street mapping systems (Delorme for one) you'll
: >be able to sit at home and watch them driving down the street on
: >your home computer. Should be able to do this cheap. A couple of
: >hundred dollars (with cheap GPS and cheap phone). I have no ideas
: >on keeping cellular costs down though. One thought would be to set
: >the phone to answer and power up the whole gizmo and then shut down
: >after a call is placed into it. You wouldn't get a continuous
: >signal but you'd be able to find where someone is on demand (if they're
: >within cellular calling range). Such a setup could last for a LONG
: >time with the proper battery.

: You aren't going to be able to get a GPS and cell phone for a couple
: hundred dollars. The cheapest GPS receivers are around $400, and so
: are cell phones unless you roll their cost into a long term service
: contract. And monthly and per minute cell phone charges will mount
: up fairly rapidly. By using packet radio, amateur or commercial,
: you can send position updates on a regular basis without incurring
: quite as much cost.

: DeLorme Mapping and City Streets are a couple of commercial map
: systems that work with GPS. However, APRS (Automatic Packet Reporting
: System) is in some ways better. While it lacks the friendly user
: interface of the commercial products, and it's pre-made map databases
: are skimpy, you can make your own maps, and it works with local and
: remote GPS receivers (using packet UI frames for the latter). It also
: supports other information about the remote sites such as range and
: bearing data from DF equipment, and arbitary text messages.

: However, what many of us want is *differential* GPS. The Coast Guard,
: FAA, and others send out position deltas from a fixed benchmark
: receiver that are received and used to correct the reading of the local
: GPS receiver. These transmissions are either at MF or VHF depending on
: the system. A special receiver is required, and either a GPS receiver
: designed to work with differential signals, or a PC that can take the
: timestamped position reports and reconcile them via software, is used
: to give a true position. This method removes the deliberate SA jitter,
: and other error sources such as varying atmospheric propagation factors,
: from the position data. This allows much greater precision in determining
: location than raw GPS alone.

: It would be nice if the APRS author would support this mode in his
: software. Some of us are willing to set up benchmark receivers on
: the amateur bands. That timestamped data could be used to correct
: the positions reported by the rover receivers over packet.

: Gary
: --
: Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
: Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
: 534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary

: Lawrenceville, GA 30244 | | gary@ke4zv.atl.ga.us

This has already been done on an experimental basis here in the Annaoplis area: A cooperating ham otransmits a differential signal on the same freq as the APRS net. Receive it thru your TNC and it goes into the GPS receiver. Works fine.

(Wierd trouble with a missing letter - regrets)

Bob
ht os

End of Ham-Space Digest V94 #230
****
.
QUIT

1332. QSL Route for RS-12 Robot

Newsgroup: rec.radio.amateur.space
Date: 1994-08-25 12:45:37 UTC
From: gerheim@sonalysts.com
Message-ID: <33i3ph$h0j@hatch.sonalysts.com>
Source record: 27034

Does anyone know the QSL route for the RS-12 robot? I worked it a few weeks ago, and don't recall the route. TNX,

--
****
Al Gerheim Sonalysts, Inc.
Email: gerheim@sonalysts.com 215 Parkway North
Work: (203)442-4355 Waterford CT 06385
****

1333. Re: satellite tracking for X?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-25 16:11:56 UTC
From: Tom WB7ASR <tom_boza@ccm.hf.intel.com>
Message-ID: <33ig65$lto@chnews.intel.com>
Source record: 27036

About six months ago, one of the mask designers had a Xwindows program called "Sattrak" for UNIX. He has since left the Corp. and I don't know how to contact him. Maybe someone on the NET can tell you where you might find a copy.

Tom WB7ASR...

In article <Cv2q2A.6Mn@ucdavis.edu>, <dantodd@wheel.ucdavis.edu> writes:
> Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
> : In article <jeppe.777350906@zetor.clinet.fi>,
> : Joachim Paganus <jeppe@clinet.fi> wrote:
> : > Does anyone know if there is a satellite tracking program for X-windows
> : > that shows the satellite and its coverage over a map in real-time?
> : > (Like Traksat, STS+ and zillions of other tracking programs for dos)
>
> : In a recent rec.radio.amateur.space article Tom
> : (tom_boza@ccm.hf.intel.com) wrote about an article in the July/August
> : issue of THE AMSAT JOURNAL, in which it talked about a Windows prog. It
> : has full support for the Kansas City tracker/tuner , wtc, wtc.
>
> Perhaps Joachim's use of the plural confused you. X-window is the(a)
> windowing system to allow gui manipulation of Unix processes. It also has
> a number of widgets which can be used to create graphical programs etc. I
> too would be interested in finding sat-tracking software for X as well as
> software that will compile and run under Linux (I'm pretty new to Unix
> administration, compiling etc. so binaries are best :-)
>
> Thanks,
> dan
> --
> *--*
> * Daniel D. Todd KC6UUD WWW Publisher *
> * dantodd@wheel.ucdavis.edu http://wheel.ucdavis.edu *
> * msmosaic@wheel.ucdavis.edu (WWW stuff) http://www.ucdavis.edu *
> *--*
> * The Woodstock '94 motto: *
> * Tune in, Turn on, ... Sell out. *
> * comedy central *
> *--*

1334. Re: Converting Grid to Lat-Lon

Newsgroup: rec.radio.amateur.space
Date: 1994-08-25 20:00:33 UTC
From: lgenco@crl.com
Message-ID: <aRENkWpGkDp5070yn@crl.com>
Source record: 27037
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

In article <9408250942.ZM25231@SALCIUS2>,
Wayne_Estes@csg.mot.com (Wayne_Estes) wrote:

> I'm looking for a DOS or Windows program that can:
>
> A. Convert 6-digit Maidenhead grid to Latitude/Longitude.
> B. Convert Latitude/Longitude to 6-digit Maidenhead grid.

Wayne -

The attached Quick BASIC program will perform the functions you
mentioned above. Sorry, I don't know who was the original author, so
can't give appropriate credits.

73 de Lou / N5SGL

```
'Grid Square <-> latitude/longitude conversion
'
START:
CLS : COLOR 0, 7: PRINT "GRID SQUARE LOCATOR": COLOR 7, 0: PRINT
PRINT "Which do you want to convert FROM?": PRINT
COLOR 0, 7: PRINT "L"; : COLOR 7, 0: PRINT "at/Lon ";
COLOR 0, 7: PRINT "G"; : COLOR 7, 0: PRINT "rid ";
COLOR 0, 7: PRINT "Q"; : COLOR 7, 0: PRINT "uit": PRINT

RPT1:
a$ = ""
DO
a$ = INKEY$
LOOP UNTIL a$ <> ""
IF UCASE$(a$) = "Q" THEN END
IF UCASE$(a$) = "L" THEN GOTO LL
IF UCASE$(a$) = "G" THEN GOTO GRID
GOTO RPT1

LL:
CLEAR : e9 = .000001
CLS : COLOR 0, 7: PRINT "LAT/LON": COLOR 7, 0: PRINT
PRINT "Enter SOUTH latitude and EAST longitude as NEGATIVE numbers."
PRINT
INPUT "LAT (DD.MM)"; l
IF l < -90 OR l > 90 THEN RUN
INPUT "LON (DDD.MM)"; o
IF o < -180 OR o > 180 THEN RUN
```

```
os = SGN(o): o = ABS(o): ls = SGN(l): l = ABS(l)
la = (INT(l) + (l - INT(l)) / .6) * ls
lo = (INT(o) + (o - INT(o)) / .6) * os
IF lo < 0 THEN lo = lo + 360
w3 = 180 - lo: IF w3 < 0 THEN w3 = w3 + 360
w1 = INT(w3 / 20 + e9)
w2 = INT((w3 - 20 * w1) / 2 + e9) + 48: w1 = w1 + 65
w3 = INT(24 * (w3 / 2 - INT(w3 / 2)) + e9) + 65
l1 = INT((la + 90) / 10 + e9): l2 = INT(la + 90 + e9 - 10 * l1)
l3 = INT((la + 90 - 10 * l1 - l2) * 24 + e9)
l1 = l1 + 65: l2 = l2 + 48: l3 = l3 + 65
g$ = CHR$(w1) + CHR$(l1) + CHR$(w2) + CHR$(l2) + CHR$(w3) + CHR$(l3)
PRINT : PRINT "Grid square = "; UCASE$(g$)
LOCATE 24, 1: PRINT "< Press a key to continue >";
a$ = "": DO: a$ = INKEY$: LOOP UNTIL a$ <> "": GOTO START

GRID:
CLEAR : e9 = .000001
CLS : COLOR 0, 7: PRINT "GRID SQUARE": COLOR 7, 0: PRINT
PRINT "Enter 2-, 4-, or 6-character grid square."
PRINT "Short ones will be optimized to center of square.": PRINT
INPUT "Grid square"; g$
g$ = UCASE$(g$)
l3 = LEN(g$): IF l3 < 2 OR l3 > 6 THEN RUN
IF l3 = 1 OR l3 = 3 OR l3 = 5 THEN RUN
SELECT CASE l3
CASE 2
g$ = g$ + "55LL"
CASE 4
g$ = g$ + "LL"
END SELECT
LOCATE CSRLIN - 1, 1: PRINT "Grid square = "; g$; " "
RESTORE
FOR x = 1 TO 6
READ y$, z$
t$ = MID$(g$, x, 1): IF t$ < y$ OR t$ > z$ THEN RUN
NEXT x
DATA A,R,A,S,0,9,0,9,A,X,A,X
w1 = ASC(LEFT$(g$, 1)) - 65
w2 = ASC(MID$(g$, 3, 1)) - 48
w3 = ASC(MID$(g$, 5, 1)) - 65
lo = 180 - 20 * w1 - 2 * w2 - w3 / 12 - 1 / 24
IF lo < 0 THEN lo = lo + 360
l1 = ASC(MID$(g$, 2, 1)) - 65
l2 = ASC(MID$(g$, 4, 1)) - 48
l3 = ASC(RIGHT$(g$, 1)) - 65
la = -90 + 10 * l1 + l2 + l3 / 24 + 1 / 48
IF lo > 180 THEN lo = lo - 360
ls = SGN(la): la = ABS(la)
l = (INT(la) + INT((la - INT(la)) * 60) / 100) * ls
```

```
os = SGN(lo): lo = ABS(lo)
o = (INT(lo) + INT((lo - INT(lo)) * 60) / 100) * os
PRINT
PRINT "LAT (DD.MM) ="; l
PRINT "LON (DDD.MM) ="; o
PRINT
PRINT "(SOUTH latitude and EAST longitude shown as negative numbers.)"
LOCATE 24, 1: PRINT "< Press a key to continue >";
a$ = "": DO: a$ = INKEY$: LOOP UNTIL a$ <> ""
GOTO START
```

1335. Re: satellite tracking for X?

Newsgroup: rec.radio.amateur.space
Date: 1994-08-26 00:06:53 UTC
From: kupiec@tigger.jvnc.net
Message-ID: <1994Aug26.000653.1489@tigger.jvnc.net>
Source record: 27038

In <33ig65$lto@chnews.intel.com>, tom_boza@ccm.hf.intel.com writes:
>
>About six months ago, one of the mask designers had a Xwindows program
>called "Sattrak" for UNIX. He has since left the Corp. and I don't know how
>to contact him. Maybe someone on the NET can tell you where you might find a
>copy.

Manfred Bester's UNIX SatTrack is available at ftp.jvnc.net in
/priv/kupiec. It tracks satellites in real-time on a VT-100 compatable
terminal.

The only satellite trackers for X are: (are there any others?)

Source for these can be obtained at various sites. (use archie)

Xsat: Makes PostScript maps of satellite tracks.
Xephem: Tracks planets/stars in real-time, satellites can also be tracked.
(A Linux binary of Xephem is available at the site mentioned above.)
SFS: (Space Flight Simulator) Tracks satellties / moon / planets with
views from many perspectives. Near real-time.

Hope this helps.

>In article <Cv2q2A.6Mn@ucdavis.edu>, <dantodd@wheel.ucdavis.edu> writes:
>> Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
>> : In article <jeppe.777350906@zetor.clinet.fi>,
>> : Joachim Paganus <jeppe@clinet.fi> wrote:
>> : > Does anyone know if there is a satellite tracking program for X-windows
>> : > that shows the satellite and its coverage over a map in real-time?
>> : > (Like Traksat, STS+ and zillions of other tracking programs for dos)
>>
>> : In a recent rec.radio.amateur.space article Tom
>> : (tom_boza@ccm.hf.intel.com) wrote about an article in the July/August
>> : issue of THE AMSAT JOURNAL, in which it talked about a Windows prog. It
>> : has full support for the Kansas City tracker/tuner , wtc, wtc.
>>
>> Perhaps Joachim's use of the plural confused you. X-window is the(a)
>> windowing system to allow gui manipulation of Unix processes. It also has
>> a number of widgets which can be used to create graphical programs etc. I
>> too would be interested in finding sat-tracking software for X as well as
>> software that will compile and run under Linux (I'm pretty new to Unix
>> administration, compiling etc. so binaries are best :-)

--
Bob Kupiec (HAM: N3MML) Phone: 609-897-7319 JvNC (GES, Inc.)
Network Operations & 800-35-TIGER x7319 3 Independence Way

Email: kupiec@jvnc.net Fax : 609-897-7310 Princeton, NJ 08540

1336. Two-Line Orbital Element Sets (TLE458)

Newsgroup: rec.radio.amateur.space
Date: 1994-08-26 23:09:40 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.777942580@afit.af.mil>
Source record: 27039

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (513) *253-9767*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #458 -
Alouette 1
1 00424U 62049 94232.05830949 .00000041 00000-0 37602-4 0 223
2 00424 80.4618 221.9794 0022577 313.9875 45.9408 13.67816791591130
ATS 1
1 02608U 66110A 94228.68606386 -.00000319 00000-0 10000-3 0 8984
2 02608 14.5833 359.8261 0010122 48.6822 112.5144 1.00355405 18079
ATS 3
1 03029U 67111A 94236.46664458 -.00000124 00000-0 10000-3 0 2396
2 03029 14.6942 6.8104 0009683 264.8587 123.6131 1.00272939 98127
Cosmos 398
1 04966U 71016A 94237.53258517 .00102799 69830-5 19210-3 0 4597
2 04966 51.4451 54.3688 0961379 212.2167 141.6354 14.03571955782435
Starlette
1 07646U 75010A 94238.28318395 -.00000127 00000-0 11132-4 0 8117
2 07646 49.8273 236.7442 0206106 207.7499 151.2272 13.82187173987543
LAGEOS
1 08820U 76039A 94237.78859385 -.00000006 00000-0 10000-3 0 252
2 08820 109.8254 159.4344 0044166 270.3201 89.2406 6.38664624171592
ETS-2
1 09852U 77014A 94219.48934716 -.00000296 00000-0 10000-3 0 9756
2 09852 12.2413 40.9026 0003241 64.4033 333.2913 1.00011018 10849
GOES 2
1 10061U 77048A 94237.27691231 .00000056 00000-0 00000+0 0 3905
2 10061 11.3217 44.8716 0001489 31.6655 221.9718 1.00291997 7806
IUE
1 10637U 78012A 94236.95011947 -.00000282 00000-0 10000-3 0 331
2 10637 34.7160 93.7961 1318208 38.0046 130.3018 1.00246199 13416
GPS BI-01
1 10684U 78020A 94220.74255890 .00000002 00000-0 10000-3 0 2891
2 10684 64.6756 43.9524 0062415 163.6827 196.5634 1.98069650105973
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GPS BI-02
1 10893U 78047A 94237.19252726 -.00000016 00000-0 10000-3 0 944
2 10893 63.5402 282.2105 0215432 14.0890 346.5878 2.01628183119465
GOES 3
1 10953U 78062A 94234.62254442 .00000033 00000-0 10000-3 0 3581
2 10953 10.2585 47.6822 0005983 69.7817 259.4319 1.00262742 12384
SeaSat 1
1 10967U 78064A 94230.86806670 -.00000034 00000-0 33386-4 0 3154
2 10967 108.0006 231.9264 0002115 237.2247 122.8694 14.37972590845379
GPS BI-03
1 11054U 78093A 94236.46232175 -.00000014 00000-0 10000-3 0 2120
2 11054 63.1998 279.7282 0045096 178.5532 181.5783 1.93505930115837
Nimbus 7
1 11080U 78098A 94230.71286358 -.00000070 00000-0 -24899-4 0 4192
2 11080 99.0462 111.9821 0008912 329.8918 30.1722 13.83727936798722
GPS BI-04
1 11141U 78112A 94235.75558958 -.00000041 00000-0 00000+0 0 9111
2 11141 64.6831 44.8430 0048448 26.8739 333.3645 1.92894541 5087
GPS BI-05
1 11690U 80011A 94237.71758992 -.00000029 00000-0 10000-3 0 8276
2 11690 65.0528 45.1910 0143151 195.2088 164.3834 2.00558797120930
GPS BI-06
1 11783U 80032A 94235.33203189 -.00000006 00000-0 10000-3 0 09
2 11783 62.6338 275.9542 0210718 28.8258 332.3642 2.03457085105324
GOES 5
1 12472U 81049A 94230.72694734 -.00000049 00000-0 10000-3 0 7848
2 12472 6.9535 57.3331 0006684 20.6379 32.7243 1.00335784 6399
Cosmos 1383
1 13301U 82066A 94238.09645054 .00000024 00000-0 10535-4 0 3234
2 13301 82.9289 258.4963 0025911 263.1647 96.6555 13.68057290606988
LandSat 4
1 13367U 82072A 94237.21156268 .00000015 00000-0 13466-4 0 5261
2 13367 98.1743 294.4871 0008111 43.8420 316.3421 14.57125702644111
IRAS
1 13777U 83004A 94238.06464225 -.00000272 00000-0 -15733-3 0 6931
2 13777 98.9728 67.5648 0012341 119.9066 240.3323 13.99210248260913
Cosmos 1447
1 13916U 83021A 94237.72331169 .00000021 00000-0 60855-5 0 4246
2 13916 82.9474 320.2699 0037006 193.5039 166.5132 13.74312989572884
TDRS 1
1 13969U 83026B 94230.61631120 -.00000217 00000-0 10000-3 0 3275
2 13969 7.8201 50.4442 0008545 89.1636 134.0734 1.00267264 14670
GOES 6
1 14050U 83041A 94237.24475413 .00000025 00000-0 10000-3 0 2579
2 14050 5.7540 60.2668 0004491 4.8407 230.5920 1.00233211 13471
OSCAR 10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
LandSat 5
1 14780U 84021A 94237.18005613 .00000009 00000-0 12028-4 0 1183
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2 14780 98.1567 295.5497 0005840 52.0511 308.1215 14.57138065557524
UoSat 2
1 14781U 84021B 94230.06784702 .00000094 00000-0 23839-4 0 7189
2 14781 97.7856 241.8945 0013013 72.1530 288.1092 14.69237688559399
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94238.29136258 .00000033 00000-0 18790-4 0 6248
2 15055 82.9550 13.3392 0028767 23.5425 336.7039 13.73609319510255
GPS BI-10
1 15271U 84097A 94235.44911183 -.00000008 00000-0 10000-3 0 8428
2 15271 62.3360 276.0938 0147575 349.6387 10.1425 2.00584286 71952
Cosmos 1602
1 15331U 84105A 94230.86141489 .00000302 00000-0 32872-4 0 3108
2 15331 82.5312 19.0302 0021004 1.5618 358.5667 14.84444728533815
NOAA 9
1 15427U 84123A 94237.81813694 .00000095 00000-0 74410-4 0 9299
2 15427 99.0437 289.1003 0015598 26.1506 334.0451 14.13637437500097
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94236.63478879 .00001825 00000-0 31703-4 0 7194
2 16609 51.6461 203.9445 0000792 298.4024 61.6880 15.56834944486681
SPOT 1
1 16613U 86019A 94236.83087835 .00000090 00000-0 62356-4 0 7170
2 16613 98.6835 309.2473 0001323 29.3289 330.7962 14.20365989126307
Cosmos 1766
1 16881U 86055A 94230.07971947 .00000244 00000-0 26716-4 0 2258
2 16881 82.5183 77.7551 0020738 27.2675 332.9623 14.83472000434631
EGP
1 16908U 86061A 94230.24072683 -.00000097 00000-0 00000+0 0 9171
2 16908 50.0096 253.6265 0011430 111.0744 249.1314 12.44410354 33112
NOAA 10
1 16969U 86073A 94237.88634368 .00000029 00000-0 30505-4 0 8252
2 16969 98.5107 244.7655 0013858 122.5597 237.6923 14.24903073412420
MOS-1
1 17527U 87018A 94237.20209055 .00000091 00000-0 99794-4 0 1145
2 17527 99.0290 304.4269 0001661 56.7809 303.3504 13.94906501382560
GOES 7
1 17561U 87022A 94237.51155730 -.00000056 00000-0 10000-3 0 9863
2 17561 1.6950 74.7811 0003991 2.5517 327.6604 1.00273393 10662
Kvant-1
1 17845U 87030A 94237.98275901 -.00006650 00000-0 -84223-4 0 9610
2 17845 51.6444 197.2062 0001400 341.5860 18.3871 15.56836294486982
DMSP B5D2-3
1 18123U 87053A 94237.85549038 .00000025 00000-0 35370-4 0 6193
2 18123 98.7854 68.5224 0014550 345.8588 14.2177 14.15369176370949
RS-10/11
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1 18129U 87054A 94237.62528881 .00000047 00000-0 34922-4 0 9445
2 18129 82.9238 277.5203 0011120 184.4137 175.6921 13.72340723359431
Meteor 2-16
1 18312U 87068A 94238.28253586 .00000033 00000-0 16866-4 0 3226
2 18312 82.5580 156.2729 0011083 281.0721 78.9194 13.84035838354756
Meteor 2-17
1 18820U 88005A 94237.89502321 .00000035 00000-0 18091-4 0 3787
2 18820 82.5389 213.1278 0017039 351.1562 8.9298 13.84720045332001
DMSP B5D2-4
1 18822U 88006A 94237.53228907 -.00000034 00000-0 34129-5 0 7310
2 18822 98.4320 89.6024 0006264 129.2939 230.8791 14.23114193340467
Glonass 34
1 19163U 88043A 94233.17791041 .00000018 00000-0 10000-3 0 9188
2 19163 65.0536 108.2620 0007141 146.5735 213.5692 2.13102385 48049
Glonass 36
1 19165U 88043C 94222.90998084 .00000018 00000-0 10000-3 0 3099
2 19165 65.0238 108.5698 0002613 319.2436 40.8088 2.13102253 48442
METEOSAT 3
1 19215U 88051A 94235.15330898 -.00000273 00000-0 10000-3 0 9762
2 19215 1.8736 71.8961 0000573 115.7852 123.7633 1.00282707 10587
AO-13
1 19216U 88051B 94237.86593587 .00000229 00000-0 10000-4 0 9557
2 19216 57.7485 234.5610 7229667 348.7691 1.1524 2.09719945 15976
OKEAN 1
1 19274U 88056A 94238.27878221 .00000155 00000-0 16414-4 0 9310
2 19274 82.5148 170.0868 0020609 134.2837 226.0069 14.82205022331466
Meteor 3-2
1 19336U 88064A 94238.13326380 .00000051 00000-0 10000-3 0 3185
2 19336 82.5399 274.1885 0018408 86.5138 273.8092 13.16968788292468
Glonass 39
1 19503U 88085C 94232.32150218 -.00000088 00000-0 10000-3 0 2151
2 19503 65.7689 347.1939 0006742 166.2046 193.8336 2.13102040 46131
NOAA 11
1 19531U 88089A 94237.88979598 .00000015 00000-0 33034-4 0 7463
2 19531 99.1786 228.5284 0011355 302.0820 57.9248 14.13011633304984
TDRS 2
1 19548U 88091B 94236.50916705 .00000082 00000-0 10000-3 0 9938
2 19548 1.1582 76.7815 0002098 22.3253 245.4540 1.00276769 8882
Glonass 40
1 19749U 89001A 94231.89152019 .00000013 00000-0 10000-3 0 4221
2 19749 65.0063 107.8848 0006733 239.5620 120.4743 2.13101397 43638
Glonass 41
1 19750U 89001B 94234.76330500 .00000015 00000-0 10000-3 0 3215
2 19750 65.0076 107.8400 0007000 264.2567 95.7263 2.13101882 43710
GPS BII-01
1 19802U 89013A 94237.03208028 -.00000010 00000-0 10000-3 0 9434
2 19802 55.1251 136.9824 0030170 177.8610 182.1821 2.00555973 40435
Akebono
1 19822U 89016A 94235.75787828 .00004719 00000-0 25040-3 0 3158
2 19822 75.1154 144.3981 3817063 241.2045 75.4426 7.78873639114555
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Meteor 2-18
1 19851U 89018A 94238.11286371 .00000057 00000-0 37638-4 0 3194
2 19851 82.5178 88.1788 0015481 34.2843 325.9312 13.84371452277368
MOP-1
1 19876U 89020B 94235.16877315 -.00000090 00000-0 10000-3 0 547
2 19876 0.5889 66.3303 0001586 67.8332 249.5795 1.00272944 834
TDRS 3
1 19883U 89021B 94232.91003067 -.00000292 00000-0 00000+0 0 9707
2 19883 0.0425 85.4709 0002291 213.6173 316.3607 1.00265692192449
GPS BII-02
1 20061U 89044A 94234.87990715 -.00000075 00000-0 10000-3 0 9562
2 20061 54.6172 313.7139 0135218 209.5302 149.7736 2.00564819 38131
Nadezhda 1
1 20103U 89050A 94237.85236788 .00000037 00000-0 23146-4 0 980
2 20103 82.9561 236.3730 0038869 94.5816 265.9781 13.73842435257877
GPS BII-03
1 20185U 89064A 94235.71175816 -.00000007 00000-0 00000+0 0 9573
2 20185 54.9256 137.6284 0014846 329.5267 30.4315 2.00565770 36723
GMS 4
1 20217U 89070A 94235.74076369 -.00000301 00000-0 10000-3 0 700
2 20217 0.3879 74.2413 0000828 32.2731 272.1462 1.00267338 18775
GPS BII-04
1 20302U 89085A 94235.24753388 -.00000007 00000-0 00000+0 0 9605
2 20302 53.5358 253.9421 0005953 233.4902 126.4957 2.00567253 35517
Meteor 3-3
1 20305U 89086A 94238.18435652 .00000044 00000-0 10000-3 0 1287
2 20305 82.5490 221.5743 0008324 118.2908 241.9085 13.04411216232021
COBE
1 20322U 89089A 94238.07120424 -.00000264 00000-0 -14075-3 0 411
2 20322 98.9730 253.2989 0009851 75.2600 284.9659 14.03437163244193
Kvant-2
1 20335U 89093A 94237.98275901 -.00006650 00000-0 -84223-4 0 160
2 20335 51.6444 197.2062 0001400 341.5860 18.3871 15.56836294486902
GPS BII-05
1 20361U 89097A 94236.25673279 -.00000029 00000-0 10000-3 0 8322
2 20361 55.5655 79.5711 0076130 112.8923 247.9831 2.00560301 25017
SPOT 2
1 20436U 90005A 94237.23264003 .00000095 00000-0 65161-4 0 8316
2 20436 98.7150 310.6388 0001858 41.3200 318.8108 14.20035405237890
UO-14
1 20437U 90005B 94237.78256282 -.00000002 00000-0 16389-4 0 248
2 20437 98.5882 321.6079 0011451 351.4938 8.6048 14.29852763239536
UO-15
1 20438U 90005C 94238.24143776 -.00000025 00000-0 73769-5 0 8232
2 20438 98.5880 320.9559 0010412 354.3158 5.7903 14.29182429239513
PACSAT
1 20439U 90005D 94233.77699511 -.00000006 00000-0 14853-4 0 8214
2 20439 98.5971 318.9613 0011829 3.6145 356.5119 14.29906526238973
DO-17
1 20440U 90005E 94237.78305295 .00000004 00000-0 18508-4 0 8234
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2 20440 98.5966 323.2625 0011729 351.4817 8.6162 14.30046659239563
WO-18
1 20441U 90005F 94238.24942333 -.00000028 00000-0 62370-5 0 8253
2 20441 98.5975 323.7203 0012272 350.1310 9.9626 14.30020248239632
LO-19
1 20442U 90005G 94233.74516393 -.00000000 00000-0 16762-4 0 8205
2 20442 98.5972 319.5444 0012834 2.4340 357.6897 14.30117282239003
GPS BII-06
1 20452U 90008A 94233.16837914 -.00000019 00000-0 10000-3 0 9412
2 20452 54.0512 193.8731 0053762 75.9493 284.6047 2.00555208 33457
MOS-1B
1 20478U 90013A 94236.74535535 .00000091 00000-0 10000-3 0 6693
2 20478 99.0337 308.1428 0001110 91.7097 268.4191 13.94904252152206
DEBUT
1 20479U 90013B 94238.32229035 .00000003 00000-0 77028-4 0 8199
2 20479 99.0476 17.0445 0540787 180.2612 179.8280 12.83323862213134
FO-20
1 20480U 90013C 94237.99414091 -.00000027 00000-0 96181-5 0 7199
2 20480 99.0474 16.6588 0540587 181.2801 178.6941 12.83227488213088
MOS-1B R/B
1 20491U 90013D 94237.48216011 .00000049 00000-0 15165-3 0 396
2 20491 99.0188 63.0958 0470863 45.0687 318.7568 13.02989406215684
LACE
1 20496U 90015A 94238.27914130 .00001148 00000-0 43554-4 0 4397
2 20496 43.1037 10.0844 0009168 98.4752 261.7136 15.33300188252284
Nadezhda 2
1 20508U 90017A 94237.81162535 .00000004 00000-0 -12674-4 0 998
2 20508 82.9536 11.0434 0046012 47.4161 313.0863 13.73479022225101
OKEAN 2
1 20510U 90018A 94238.16896440 .00000167 00000-0 19839-4 0 3330
2 20510 82.5255 119.8699 0018776 326.8566 33.1466 14.78364027242008
INTELSAT-6
1 20523U 90021A 94235.59755501 -.00000260 00000-0 10000-3 0 4475
2 20523 0.0286 17.9277 0000606 141.9466 352.3968 1.00269579 9268
GPS BII-07
1 20533U 90025A 94234.56279156 -.00000075 00000-0 00000+0 0 9400
2 20533 54.9502 314.2425 0044478 82.6823 277.1986 2.00547496 32256
PegSat
1 20546U 90028A 94237.79447550 .00003296 00000-0 76402-4 0 6767
2 20546 94.1294 337.2755 0074692 31.4049 329.1634 15.39664803242976
HST
1 20580U 90037B 94237.18233050 .00000368 00000-0 21433-4 0 5272
2 20580 28.4672 152.7726 0006430 91.5600 268.5722 14.90658952 39698
MACSAT 2
1 20608U 90043B 94237.88619896 .00000085 00000-0 11944-4 0 225
2 20608 89.9281 178.9918 0104020 206.9047 152.6749 14.64735617229486
Glonass 44
1 20619U 90045A 94233.66838771 -.00000084 00000-0 00000+0 0 1100
2 20619 65.3435 346.7041 0023965 208.5696 151.3105 2.13102683 33123
Glonass 45
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1 20620U 90045B 94236.60265894 -.00000074 00000-0 00000+0 0 1232
2 20620 65.3437 346.5973 0006999 45.2085 314.8726 2.13102479 33224
Glonass 46
1 20621U 90045C 94237.60645621 -.00000072 00000-0 10000-3 0 7299
2 20621 65.3723 346.6038 0014786 184.0851 175.9293 2.13101509 33242
Kristall
1 20635U 90048A 94237.98275901 -.00006650 00000-0 -84223-4 0 8095
2 20635 51.6444 197.2062 0001400 341.5860 18.3871 15.56836294486871
ROSAT
1 20638U 90049A 94233.93521574 .00000008 00000-0 19543-4 0 3312
2 20638 52.9900 53.9164 0011017 260.9137 99.0602 15.06890965231991
Meteor 2-19
1 20670U 90057A 94237.84242572 -.00000100 00000-0 -10269-3 0 8224
2 20670 82.5492 153.1521 0015266 317.8384 42.1597 13.84184080210254
CRRES
1 20712U 90065A 94237.91834597 .00000162 00000-0 17976-3 0 9579
2 20712 17.5368 160.0380 7194500 241.1596 30.3512 2.35165262 27539
GPS BII-08
1 20724U 90068A 94233.39491868 -.00000016 00000-0 10000-3 0 8279
2 20724 54.7531 135.4041 0111848 163.9608 196.4391 2.00561559 29654
Feng Yun1-2
1 20788U 90081A 94237.80188351 -.00000291 00000-0 -16483-3 0 510
2 20788 98.8343 255.7172 0015156 175.7869 184.3441 14.01340695203454
Meteor 2-20
1 20826U 90086A 94238.09508930 .00000038 00000-0 20929-4 0 8313
2 20826 82.5229 90.3673 0012265 208.4393 151.6095 13.83588293197421
GPS BII-09
1 20830U 90088A 94233.94770355 -.00000016 00000-0 10000-3 0 8350
2 20830 55.5138 77.6802 0068377 103.1578 257.6866 2.00564039 28748
GPS BIIA-10
1 20959U 90103A 94234.84319830 -.00000008 00000-0 00000+0 0 7419
2 20959 54.9469 137.2451 0086031 226.7871 132.5403 2.00563424 27359
DMSP B5D2-5
1 20978U 90105A 94237.38689629 .00000069 00000-0 40884-4 0 8551
2 20978 98.6815 301.0325 0079072 321.6294 37.9280 14.32448993194966
Glonass 47
1 21006U 90110A 94233.88094788 .00000018 00000-0 00000+0 0 6910
2 21006 64.9734 107.1658 0059322 187.8172 172.1793 2.13102668 28837
Glonass 48
1 21007U 90110B 94235.94432171 .00000007 00000-0 00000+0 0 8169
2 21007 64.9896 107.1641 0036038 180.7720 179.3158 2.13101216 28864
Glonass 49
1 21008U 90110C 94237.70942208 -.00000005 00000-0 00000+0 0 8195
2 21008 64.9677 107.0574 0008473 278.8733 81.1176 2.13099324 28890
AO-21
1 21087U 91006A 94237.04057783 .00000093 00000-0 82657-4 0 5050
2 21087 82.9423 91.7663 0033932 252.6600 107.0842 13.74543775179040
RS-12/13
1 21089U 91007A 94233.77467560 .00000028 00000-0 14135-4 0 7222
2 21089 82.9247 322.8090 0027653 286.9894 72.8230 13.74045007177656
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MOP-2
1 21140U 91015B 94236.18657461 -.00000021 00000-0 00000+0 0 7740
2 21140 0.2374 344.5971 0002445 192.4387 222.6274 1.00275825 856
Nadezhda 3
1 21152U 91019A 94237.78745902 .00000056 00000-0 43506-4 0 8956
2 21152 82.9236 275.6642 0043093 23.9004 336.4140 13.73506122172957
Glonass 50
1 21216U 91025A 94237.65293210 -.00000072 00000-0 10000-3 0 3271
2 21216 65.0869 346.3179 0009449 199.2375 160.7538 2.13103308 26428
Glonass 51
1 21217U 91025B 94235.37329365 -.00000078 00000-0 00000+0 0 7220
2 21217 65.0785 346.4058 0011241 228.2667 131.6556 2.13101443 26361
Glonass 52
1 21218U 91025C 94232.20235914 -.00000089 00000-0 10000-3 0 2194
2 21218 65.0652 346.4975 0009964 335.6716 24.3097 2.13102717 26307
GRO
1 21225U 91027B 94234.00553998 .00001653 00000-0 32615-4 0 1305
2 21225 28.4615 135.1260 0004529 229.9216 130.1013 15.41163025 67100
Meteor 3-4
1 21232U 91030A 94238.16714513 .00000050 00000-0 10000-3 0 7297
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2 23202 7.0609 115.4749 7281875 189.7393 139.9258 2.29659521 257
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Dr TS Kelso Assistant Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1337. ARLK037 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-08-27 21:08:15 UTC
From: w1aw@arrl.org
Message-ID: <$arlk037.1994@ampr.org>
Source record: 27040
Cross-posted to: rec.radio.info,rec.radio.amateur.space

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SB KEP @ ARL $ARLK037
ARLK037 Keplerian data

ZCZC SK05
QST de W1AW
Keplerian Bulletin 37 ARLK037
From ARRL Headquarters
Newington, CT August 27, 1994
To all radio amateurs

SB KEP ARL ARLK037
ARLK037 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-64
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2 20440 98.5966 323.2625 0011729 351.4817 8.6162 14.30046659239563
WO-18
1 20441U 90005F 94238.24942333 -.00000028 00000-0 62370-5 0 8253
2 20441 98.5975 323.7203 0012272 350.1310 9.9626 14.30020248239632
LO-19
1 20442U 90005G 94238.22287010 .00000002 00000-0 17822-4 0 8214
2 20442 98.5976 323.9681 0012559 349.6093 10.4840 14.30117591239649
FO-20
1 20480U 90013C 94237.99414091 -.00000027 00000-0 96181-5 0 7199
2 20480 99.0474 16.6588 0540587 181.2801 178.6941 12.83227488213088
AO-21
1 21087U 91006A 94237.04057783 .00000093 00000-0 82657-4 0 5050
2 21087 82.9423 91.7663 0033932 252.6600 107.0842 13.74543775179040
UO-22
1 21575U 91050B 94237.69952680 .00000012 00000-0 18516-4 0 5269
2 21575 98.4308 310.7777 0008664 82.2269 277.9894 14.36928321163060
KO-23
1 22077U 92052B 94238.13788509 -.00000037 00000-0 10000-3 0 4218
2 22077 66.0846 133.5251 0015427 271.3630 88.5621 12.86286430 95780
KO-25
1 22830U 93061H 94238.08256351 -.00000036 00000-0 30912-5 0 3253
2 22830 98.5465 309.7243 0011248 336.3761 23.6899 14.28060968 47672
KO-25?
1 22828U 93061F 94238.22221868 -.00000010 00000-0 13606-4 0 2971
2 22828 98.6422 313.3751 0010456 356.5523 3.5586 14.28063551 15775
IO-26
1 22826U 93061D 94238.22801645 -.00000004 00000-0 16002-4 0 3197
2 22826 98.6498 313.3668 0009630 10.7619 349.3765 14.27736954 47688
AO-27
1 22825U 93061C 94237.69144542 -.00000011 00000-0 13367-4 0 3191
2 22825 98.6483 312.7864 0009327 10.4628 349.6745 14.27632153 47601
PO-28
1 22829U 93061G 94238.22903891 .00000008 00000-0 20751-4 0 3128
2 22829 98.6456 313.3995 0010379 357.0335 3.0779 14.28037635 47693
Mir
1 16609U 86017A 94236.63478879 .00001825 00000-0 31703-4 0 7194
2 16609 51.6461 203.9445 0000792 298.4024 61.6880 15.56834944486681

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
August 30, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1338. ANS-239 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-08-28 22:55:53 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-239.01.1994@ampr.org>
Source record: 27042
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-239.01
STS-64 SAREX MISSION INFO

HR AMSAT NEWS SERVICE BULLETIN 239.01 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 27, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-239.01

STS-64 SAREX Update

The next Shuttle Amateur Radio Experiment (SAREX) mission is now less than two weeks away. The STS-64 Space Shuttle Discovery Mission, tentatively scheduled for launch on September 9, will carry SAREX voice and packet radio on a 9 day mission. More details on the upcoming SAREX flight are described in the detailed information sheet below.

STS-64 Shuttle Amateur Radio Experiment (SAREX)
Information Sheet

Mission:STS-64 Space Shuttle Discovery
Lidar In-Space Technology Experiment (LITE-1)
SPARTAN-201
Robot Operated Materials Processing System (ROMPS)

Launch:September 9, 1994, 20:30 UTC

Orbit:57 degree inclination

Mission Length:9 days (Nominal)

Amateur
Radio
Operators:Dick Richards, KB5SIW, Commander, Blaine Hammond, KC5HBS,
Pilot, and Jerry Linenger, KC5HBR, Mission Specialist

Modes:FM Voice
Prime callsign: KB5SIW

Packet Radio
Callsign: W5RRR-1

Frequencies:All operations in split mode. Do not transmit on
the downlink frequency.

Voice Freqs:Downlink:145.55 MHz (Worldwide)
Uplinks:144.91, 144.93, 144.95, 144.97, 144.99 MHz
(Except Europe)

144.70, 144.75, 144.80 MHz (Europe only)

Note: the crew will not favor any specific uplink
frequency, so your ability to work the crew will
be the "luck of the draw"

Packet Freqs:Downlink:145.55 MHz
Uplink:144.49 MHz

Info:Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland,
SAREX Bulletins and Shuttle Retransmissions
3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz
and 147.45 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT
SAREX News Bulletins
3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz
and 147.555 MHz (FM)

:Also, bulletins available on internet, via AMSAT ANS,
Compuserve, and your local PBSS.

School Group Participation: 10 school groups will participate
in SAREX with pre-scheduled direct
and telebridge contacts. These include
nine in the U.S., and one in New Zealand.
Prelaunch Keplerian Elements:

These are the Keplerian elements for STS-64 mission, rotated to the
current planned launch time of Sep 9 at 20:30 UTC. The JSC-005 epoch
is at the start of orbit 5, after the trim burns on orbits 3 and 4. The
negative drag fit was required to match the design trajectory because there
is a 6.5 fps trim burn on orbit 28. The phasing and circ burns on orbit 99
lower the altitude by about 8 n.mi, so the second element set JSC-006 is
required after that. These Keps are provided by Gil Carman, WA5NOM
at the Johnson Space Center ARC.

STS-64
1 00064U 94253.10077961 -.00030838 00000-0 -39665-4 0 59
2 00064 57.0058 195.1865 0009670 275.6619 84.3358 16.05979206 51

Satellite: STS-64
Catalog number: 00064
Epoch time: 94253.10077961 = (10 SEP 94 02:25:07.36 UTC)
Element set: 005
Inclination: 57.0058 deg
RA of node: 195.1865 deg Space Shuttle Flight STS-64
Eccentricity: .0009670 Prelaunch Element set JSC-005
Arg of perigee: 275.6619 deg Launch: 09 SEP 94 20:30 UTC
Mean anomaly: 84.3358 deg
Mean motion: 16.05979206 rev/day G. L. Carman
Decay rate: -3.0838e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 5

Checksum: 309

Note: Element set JSC-005 is valid for orbits 2 through 98.
Use JSC-006 after 15 Sep 94, 22:51:30 UTC (MET 6/03:49:30).

STS-64
1 00064U 94259.01448182 .00096406 00000-0 94275-4 0 62
2 00064 57.0059 167.2656 0009343 269.2157 90.7841 16.11240267 1002

Satellite: STS-64
Catalog number: 00064
Epoch time: 94259.01448182 = (16 SEP 94 00:20:51.23 UTC)
Element set: 006
Inclination: 57.0059 deg
RA of node: 167.2656 deg Space Shuttle Flight STS-64
Eccentricity: .0009343 Prelaunch Element set JSC-006
Arg of perigee: 269.2157 deg Launch: 09 SEP 94 20:30 UTC
Mean anomaly: 90.7841 deg
Mean motion: 16.11240267 rev/day G. L. Carman
Decay rate: 9.6406e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 100
Checksum: 286

Note: Element set JSC-006 is valid for orbits 99 through 142.
Use JSC-005 before 15 Sep 94, 22:51:30 UTC (MET 6/03:49:30).

The deorbit burn is on 18 Sep at 15:40 UTC (MET 8/20:38).
/EX
SB SAT @ AMSAT $ANS-239.02
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 239.02 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 27, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-239.02

Weekly OSCAR Status Reports: 27-AUG-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
==========
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m

Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
==========
[G3RUH/DB2OS/VK5AGR]

RS-10: In last week's OSCAR Status Reports NO1R reported that he has made some very spectacular contacts with his very modest Mode-A station arrangement. His station set-up includes a Kenwood TR-751A at 25 watts into a AEA Isopole up about 35 ft. His receiver is the Realistic HTX-100 into an inverted-vee up about 30 ft with an Advanced Receiver Research 10M preamp. This week NO1R reports that he has just received a QSL from Andy Mironov at RS3A confirming my RS-10 Robot QSO in April. Andy also writes: "I will be glad to have any info abt your work via RS: your DX? PSE send by post or packet. 73 Andy" The packet address is for Andy is: RK3KPK@RK3KP.RUS.EU [NO1R]

AO-13: N7RYW would like to pass on a note about the Mode-S transponder. He has noticed that there is one station who continually sweeps the uplink, looking for his downlink signal. This is fine normally, N7RYW says, but as this station starts to increase his power far in excess of what is needed when he is unable to find himself. The net effect of this is that other stations can't hear themselves either because the AGC on the uplink receiver has reduced its sensitivity to compensate for this strong signal. This has the effect of reducing the AGC affects EVERYONES, making it impossible to even hear their own signals! N7RYW has tried to respond to this station CW CQs when it finally does settle down (over 20 minutes one day!), but it does not respond to N7RYW's SSB call. N7RYW says he doesn't have a key, and doesn't want to install one just for just one single lid! All of the Mode-S users N7RYW has talked with are well aware of the power limits for uplinking with this one exception. N7RYW will not single out this person with their callsign, so he hopes a call to him in this way, with as much information as possible, without the call, will get his attention. This problem is ongoing, and serious. A station recently was attempting their first QSO on Mode-S a few days ago, and could not get it done due to this over-powered signal wiping out the trans-ponder. This is definitely NOT radar, which does not start sending CQ CQ CQ DE *****! While it won't help the excess power problem, this item may help people "find themselves." N7RYW has found that the Mode-S transponder's actual downlink appears to be 2400.735 MHz to 2400.765 MHZ, up 30 kHz from those published. N7RYW does not own a signal source with that high of frequency to verify this, but the UO-11 beacon passed zero Doppler within 1 kHz of the published frequency, so N7RYW would like to hear if anyone else has found those frequencies to be more accurate so he can verify and notify!
[N7RYW@teleport.com]

KO-23: N7RYW reports that KO-23 is now back in operation after an OBC crash. The groundstation control elected to do a data dump to try to find the cause of the crash, so it took a few extra days to get the OBC reset. [N7RYW@teleport.com]

KO-25: KO-25 is back in service. Both KITSATs were down at various times for output power tests. These tests appear to be over for now. N7RYW has noticed that when either one is down due to a crash, a peculiar tone is emitted on the transmitter. If you are getting a good signal level, but no data, turn up the volume and listen for this tone. It may save you some head scratching later! Also, on the two KITSATs, the control station usually puts out a notice when one of the sats will not be in regular service. They are usually short notices, and originate from HL0ENJ, so it might be good to mark all messages from this station for automatic downloading in your select files. [N7RYW@teleport.com]

UO-11: The 2401.5 MHz beacon was been heard by N7RYW twice with an unmodulated carrier. On the first occassion he had the polarization set at LHCP, and it was just barely audible. Later he changed to RHCP and the signal was very strong. This polarity change was done on a 6' dish with a horn type feed with dual probes fed 90 degrees apart, much like a crossed dipole. [N7RYW@teleport.com]

AO-16: AO-16 is up and running well. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1339. Looking for Mac program Macsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-29 14:57:31 UTC
From: poole@uts.cc.utexas.edu
Message-ID: <33st0r$n23@curly.cc.utexas.edu>
Source record: 27043

A while back, I used a program called Macsat. It predicted times when satellites would be visible. It read the NASA 2-line orbit element format. I'd like to get a copy of that program. Can someone send me the phone # or address of the company that sells it? Thanks.

Steve
--
Steve Poole
Center For Space Research
University of Texas at Austin
poole@gus.csr.utexas.edu or poole@csr.utexas.edu or byab305@chpc.utexas.edu

1340. Radio Astronomy

Newsgroup: rec.radio.amateur.space
Date: 1994-08-29 19:22:12 UTC
From: andrew@paddocks.demon.co.uk
Message-ID: <CvB9t0.C30@demon.co.uk>
Source record: 27046

Hi all

Sort of toying with the idea of radio astronomy in the upper amateur bands, anyone of others who might be doing this ? Or can anyone point me in the direction of some good books if they exist ?

+------------------------------+--+
| Andrew Gawthrope G0RVM | internet : andrew@paddocks.demon.co.uk |
| | compuserve : 100113,3062 |
+------------------------------+--+

1341. Re: Looking for Mac program Macsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-30 00:56:54 UTC
From: tkreyche@zdlabs.ziff.com
Message-ID: <tkreyche-290894165654@tomkreyche.zdlabs.ziff.com>
Source record: 27044

In article <33st0r$n23@curly.cc.utexas.edu>, poole@uts.cc.utexas.edu (Steve Poole) wrote:

> A while back, I used a program called Macsat....... Can someone send me
> the phone # or address of the company that sells it? Thanks.
>

Please post, I'm interested too.
Thanks, Tom Kreyche

1342. Re: Looking for Mac program Macsat

Newsgroup: rec.radio.amateur.space
Date: 1994-08-30 04:16:13 UTC
From: rdhoughton@vms4.sci.csupomona.edu
Message-ID: <1994Aug29.211613.1@clstcs>
Source record: 27045

In article <tkreyche-290894165654@tomkreyche.zdlabs.ziff.com>, tkreyche@zdlabs.ziff.com (Tom Kreyche) writes:
> In article <33st0r$n23@curly.cc.utexas.edu>, poole@uts.cc.utexas.edu (Steve
> Poole) wrote:
>
>> A while back, I used a program called Macsat..... Can someone send me
>> the phone # or address of the company that sells it? Thanks.
>>
>
> Please post, I'm interested too.
> Thanks, Tom Kreyche

Mac Sat was replaced by a newer program called OrbiTrack. It is written by Bill Bard of:

BEK Developers
PO Box 47114
St. Petersburg, FL 33743-7114

Send him $25 and you'll get the newest copy of the program and a manual or perhaps try Archie (it's shareware)

I use it in my high school physics class and I can attest that it is extremely well written and simple to use. There is an FPU and a non-FPU version. I've been wanting to ask him if he is thinking of complling a Power PC version. Perhaps if you contact him, you could find this out and post it on this newsgroup.

Sorry about the typos, I'm using a clunky editor and don't want to retype whole lines!

Bob Houghton
Science Department Chairman
John A. Rowland High School
Rowland Heights, California

1343. Re: Ham-Space Digest V94 #240

Newsgroup: rec.radio.amateur.space
Date: 1994-08-30 12:09:55 UTC
From: ik1qld@uugate.wa7slg.ampr.ORG
Message-ID: <6596@uugate.wa7slg.ampr.org>
Source record: 27047

Hy Rainer, nice to meet you. Can you give me some more about the GPS-Modules you write on your last msg? Thanks in advance. Pse reply to: ik1qld@ik1qld-10.ampr.org

Angelo Brunero, Torino Italy.

1344. Welcome to rec.radio.info!

Newsgroup: rec.radio.amateur.space
Date: 1994-08-31 03:00:07 UTC
From: rec-radio-info@ve6mgs.ampr.ab.ca
Message-ID: <rec.radio.info-welcome_778302006@ve6mgs.ampr.org>
Source record: 27050
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.amateur.digital.misc,rec.radio.amateur.policy,rec.radio.shortwave,rec.radio.cb,rec.radio.noncomm,rec.radio.scanner,rec.radio.info,news.answers,rec.answers

```
Archive-name: radio/rec-radio-info/welcome
Last-modified: $Date: 1994/01/02 22:00 $
Version: $Revision: 1.06 $

*** Welcome to rec.radio.info! ***

Welcome to rec.radio.info, a group that aims to provide a noise-free source
of information and news for the entire rec.radio hierarchy.

Two introductory articles about rec.radio.info are posted to the group and
to news.answers every two weeks. You are now reading the first article, which
explains what rec.radio.info is, and answers some Frequently Asked Questions.
The second article is titled "Submission Guidelines", and you only need to
read it if you want to submit an article to rec.radio.info.

You can skip to the next section of this article by searching for the next
" -- " string. The sections available are:
- What is the purpose of rec.radio.info?
- Why are messages almost always cross posted to rec.radio.info?
- What is a 'follow-up', and what does 'moderated' mean?
- OK, so now I know what 'moderated' means. Tell me more.
- What type of material is considered inappropriate?
- I do not have access to news, how can I get the information posted to
rec.radio.info?
- Will the material appearing in rec.radio.info be archived somewhere?
- I have a regular posting with timely information, is there a way to
speed up it's delivery, or automate for more convenience?

-- What is the purpose of rec.radio.info?

The purpose or charter of rec.radio.info is to provide the Usenet community with
a resource for information, news, and facts about any and all things radio.

All the other rec.radio groups are intended for discussions and general chit
chat about radio. Rec.radio.info will contain informational, factual articles
only. Follow-ups are redirected to an appropriate other group, and further
discussion (if any) will not take place in rec.radio.info.

In order to ensure that rec.radio.info contains only appropriate articles, it
was decided to create the group as a moderated newsgroup.

-- Why are messages almost always cross posted to rec.radio.info?

It provides a "tag" for each article to be assembled into a filtered
presentation in rec.radio.info (even with cross-posting, only one message, with
```

a unique Message-ID, is propogated across the net). This tag also facilitates a pre-existing method of dropping or cancelling the articles locally within the discussion groups if you don't want to see them. This accommodates individuals who want to separate the bulletins from the discussions, discussions from the bulletins, as well as those who are adamant about not reading another newsgroup and wanted to see everything all in one basket.

With the total size of Usenet (in number of newsgroups and total traffic) doubling every year or so, this is no insignificant contribution to reducing information noise and chaos. Making the discussion groups a catch-all, and making extra newsgroups filters on that catch-all, is also the most realistic way to implement such a scheme (It's not intuitively obvious what the charter, contents, and general appropriate topics for each and every newsgroup are. Seeing FAQ's and charter/intro postings in the home newsgroup is beneficial for new readers).

By cross-posting one only is adding a few tens of bytes to each bulletin (to specify the extra group on the Newsgroups line), but are adding the capability for very powerful filtering features available on most news servers, listservers and readers. Your local news guru could probably explain these features in more detail.

In rn, for example, according to Leanne Phillips in her rn kill-file FAQ, add a line of the form:
/Newsgroups:.*[,]rec\.radio\.info/h:j
either in ~/News/KILL (if you don't want to see rec.radio.info articles anywhere) or ~/News/rec/radio/amateur/misc/KILL (if you don't want to see them just in rec.radio.amateur.misc). The latter method means your kill file will only be consulted during rec.radio.amateur.misc (and hence runs more efficiently), and will probably work for most people.

In nn, according to Bill Wohler in his nn FAQ, add a line of the form:
rec.radio.info:!s/:^
in ~/.nn/kill (if you don't want to see rec.radio.info articles anywhere), or put the following lines:
sequence
rec.radio.info
rec.radio.
at the end of ~/.nn/init in order to see all the rec.radio.info bulletins first, then read the remaining rec.radio.* without the bulletins.

-- What is a 'follow-up', and what does 'moderated' mean?

If you are new to Usenet and are not familiar with the terminology, you might want to read the general introductory articles found in the newsgroup news.announce.newusers. Doing so will make your life on the net much easier, and will probably save you from making silly beginner's mistakes.

If you think that at this moment you are reading an echo, a conference, or a bulletin board, I'd also strongly suggest a trip over to news.announce.newusers.

For the rest of this article, I will assume you have a basic knowledge of Usenet terminology and mechanics.

A moderated group means that any article that needs to be posted to the group has to be accepted by the moderator of the group. Since we need to ensure that followups to an article (discussion) do not show up in the rec.radio.info newsgroup, the `Followup-To:' header line contains a newsgroup that is appropriate for disussions about the specific article.

-- OK, so now I know what 'moderated' means. Tell me more.

Rec.radio.info is a moderated newsgroup, which means that all articles submitted to the group will have to be approved by the moderator first.

The current moderator of the group is Mark Salyzyn. Submissions to rec.radio.info can be posted, or e-mailed to:

rec-radio-info@ve6mgs.ampr.ab.ca

Comments, criticisms, suggestions or questions about the group can be e-mailed to:
rec-radio-request@ve6mgs.ampr.ab.ca

But before you do so, please be sure to check out the "Submission Guidelines" article.

The influence of the moderator should be minimal and of an administrative nature, consisting chiefly of weeding out obviously inappropriate articles, while making sure correct headers etc. are used for the appropriate ones.

-- What type of material is considered inappropriate?

There are three broad categories of articles which will be rejected by the moderator:

1) Requests for information: rec.radio.info is strictly a one-way street. I receive information in my mailbox; I then post it to rec.radio.info. Requests for specific information belong in the normal discussion newsgroups. If your request gets answered, you might consider passing the answer on to rec.radio.info, though. Especially if you can edit it into a informational, rather than a discussion, format.

2) Obvious discussion articles, or articles that appear unsubstantiated.

3) Commercial stuff: a relatively unbiased test of a radio product would be accepted, but any hint of for-profit might be reason for rejection. For three reasons: This is not the purpose of the list, for-profit is a controversial topic, and this list may be passed onto Amateur Packet Radio (where for-profit is prohibited except under certain provisos).

rec.radio.swap (or possibly comp.newprod) may be more deserving of the posting in any matter.

Similarly, copyrighted material generally cannot be used. If it's TRULY worthwhile to the net, I would recommend obtaining permission from the copyright holder. Please note the source, and if permission was given. I

reserve the right to make the final decision concerning appropriateness in all situations. In most cases, a brief summary of, or pointer to, the copyrighted information may be all I can allow.

-- I do not have access to news, how can I get the information posted to rec.radio.info?

brian@UCSD.EDU (Brian Kantor) has kindly supplied a mail list server for rec.radio.info. Non of the articles will be digested, due to their size, so you will receive individual mailings for every article posted to the group.

Mail sent to radio-info@ucsd.edu will be forwarded to the moderator and thus is an alias to rec-radio-info@ve6mgs.ampr.ab.ca

To subscribe and unsubscribe via the listserver; the format for that is

sub address radio-info
unsub address radio-info

where 'address' is your full mailing address. Send this request to

listserv@ucsd.edu

Note that the server will automatically delete any address that bounces mail. If you leave the address portion blank, it will try to deduce your address from the mail headers. This may not work if you are on bitnet, milnet or some other non-Unix host, so it is recommended to put your return address in any case. For example:

sub mymailbox@myhost.mydomain.mil radio-info
or
sub MEMEME01@DMBHST.bitnet radio-info

or something like that.

-- Will the material appearing in rec.radio.info be archived somewhere?

< Dated information here >

Yes. Still firming up details at the moment but here is a preliminary list:
- unbc.edu as maintained by Lyndon Nerenberg <lyndon@unbc.edu>
- nic.funet.fi maintained by Risto Kotalampi <rko@cs.tut.fi>
saved to /pub/dx/text/rec.radio.info currently stored as numbered files.

Effectively this means that anything you post to rec.radio.info will be permanently stored, so your work will not be lost.

-- I have a regular posting with timely information, is there a way to speed up it's delivery, or automate for more convenience?

Yes, there is! It may take a bit of chatter with the moderator, but we are willing to take responsible people and provide them the means of posting the articles directly from their site. We will try everything we can as we fully realize that DX (distant signal) and astronomical data can be somewhat

transitory. We are also willing to allow regular posters of information the same courtesy, even if the information is not as time critical.

We refer to this as self-moderation, which is partly based on the model for news.answer. This requires co-operation and good will to be beneficial to the community in the rec.radio hierarchy.

I suggest reading the posting guidelines for more information. I am open to suggestions.

I thank the following individuals for their input into this article:
rec.music.info moderator Leo Breebaart rec-music-info@cp.tn.tudelft.nl
rec.radio.broadcasting moderator Bill Pfeiffer wdp@gagme.chi.il.us
Paul W. Schleck, KD3FU pschleck@unomaha.edu
Ian Kluft, KD6EUI ikluft@uts.amdahl.com

--
Mark Salyzyn -- Moderator rec.radio.info
Submissions to: rec-radio-info@ve6mgs.ampr.ab.ca
Administrivia to: rec-radio-request@ve6mgs.ampr.ab.ca
* Requests for information do *not* belong in rec.radio.info *

1345. Help wanted with decoding telemetry

Newsgroup: rec.radio.amateur.space
Date: 1994-09-01 08:06:23 UTC
From: u1066579@csdvax.csd.unsw.edu.au
Message-ID: <1994Sep1.180623.2502@csdvax.csd.unsw.edu.au>
Source record: 27048

HI,
I am interested in the possibility of decoding the telemetry from weather satellites. Can anyone help me with this? If so please e-mail.
Best Wishes,
Henry.

1346. Rain attenuation of satellite downlinks

Newsgroup: rec.radio.amateur.space
Date: 1994-09-01 19:46:03 UTC
From: Michael@arkas.demon.co.uk
Message-ID: <778448763snz@arkas.demon.co.uk>
Source record: 27049

This might not be exactly amateur radio, but perhaps there is an avid satellite tv dx'er out there who can help ...

I am interested in obtaining measured rain attenuation figures for C-band downlink (4 GHz) signals from communications satellites in the South-East Asian tropical region. I'm looking to compare typical, real-world attenuation values with those predicted by the CCIR model.

Can anyone point me to where I may find such information? I would prefer an Internet source, but printed references would be ok.

Emailed messages to michael@arkas.demon.co.uk would be appreciated.

TIA & 73's

--
Mike Dower
G0VEY 'Quoth the raven, "Never more".' ... Poe
VK2ENG

1347. Mir Checkpoint #734

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 13:10:01 UTC
From: tstader@aol.com
Message-ID: <347879$o13@search01.news.aol.com>
Source record: 27051

MacSPOC Users-

The enclosed checkpoint reflects tracking of Russia's Mir space station late Wednesday night CDT. Over the past few days, Mir's orbit has been changed repeatedly. A Progress resupply vehicle launched last Friday has made 2 unsuccessful automated docking attempts with Mir, and a third attempt is to be made under manual control from Mir's crew this Friday. Under standard Russian docking procedures, the attempt would be initiated around 8:38 AM CDT Friday.

Fuel reserves aboard Progress are nearly exhausted, although a fourth attempt may be possible. If a docking is not performed, however, Mir would have to be abandoned in about 2 weeks before her crew ran out of food. Without a crew, Mir's fate is unknown. A major reactivation effort was required after Mir's Salyut-7 predecessor was abandoned in 1985.

-Dan Adamo
============================
File: Mir-734.cp
==============================cut here================
Orbit 48786 ElSet 734 on 09-01-94
1994 244 (9- 1) 0 0 .000
1994 245 (9- 2) 0 0 .000
0.244959750068D+07 0.595010451348D+01
348798
0.548704952642D+07 -0.147855739048D+08 0.156357784745D+08
0.236355277376D+05 -0.432430004354D+03 -0.867535713518D+04
90.0 5000.0 79.00 2.72
==============================cut here================

73 for now.... c u on the shortwaves
Terry Stader - KA8SCP
America Online Ham Radio Club Host
Macintosh Amateur Radio Software List Maintainer
Internet: tstader@aol.com (e-mail) or
tstader@si.tiac.net (binaries/files >28K)
KA8SCP@WA1PHY.#EMA.MA.USA.NOAM
ka8scp@ka8scp.ampr.org [44.56.4.82]

1348. orbs$245.1of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 13:50:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-245.o.1994@ampr.org>
Source record: 27052
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-245.O
Orbital Elements 245.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX September 2, 1994
BID: $ORBS-245.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94215.22805310
Element set: 295
Inclination: 27.0009 deg
RA of node: 314.8290 deg
Eccentricity: 0.6026240
Arg of perigee: 199.5326 deg
Mean anomaly: 120.6764 deg
Mean motion: 2.05881876 rev/day
Decay rate: -3.02e-06 rev/day^2
Epoch rev: 8375
Checksum: 286

Satellite: UO-11
Catalog number: 14781
Epoch time: 94242.05407815
Element set: 724
Inclination: 97.7858 deg
RA of node: 253.3200 deg
Eccentricity: 0.0012823
Arg of perigee: 37.2927 deg
Mean anomaly: 322.9161 deg
Mean motion: 14.69239557 rev/day
Decay rate: 9.0e-08 rev/day^2
Epoch rev: 56115
Checksum: 306

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94244.11421328
Element set: 949
Inclination: 82.9230 deg
RA of node: 272.7226 deg
Eccentricity: 0.0011490
Arg of perigee: 166.0203 deg
```

Mean anomaly: 194.1275 deg
Mean motion: 13.72340703 rev/day
Decay rate: 1.8e-07 rev/day^2
Epoch rev: 36032
Checksum: 269

Satellite: AO-13
Catalog number: 19216
Epoch time: 94244.06465693
Element set: 957
Inclination: 57.7457 deg
RA of node: 233.4755 deg
Eccentricity: 0.7231019
Arg of perigee: 349.2254 deg
Mean anomaly: 1.1276 deg
Mean motion: 2.09726877 rev/day
Decay rate: -3.19e-06 rev/day^2
Epoch rev: 4760
Checksum: 328

Satellite: FO-20
Catalog number: 20480
Epoch time: 94242.36051676
Element set: 720
Inclination: 99.0483 deg
RA of node: 20.2052 deg
Eccentricity: 0.0540713
Arg of perigee: 171.3929 deg
Mean anomaly: 189.6913 deg
Mean motion: 12.83227880 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 21364
Checksum: 286

Satellite: AO-21
Catalog number: 21087
Epoch time: 94243.59191079
Element set: 507
Inclination: 82.9402 deg
RA of node: 86.9165 deg
Eccentricity: 0.0033651
Arg of perigee: 233.2799 deg
Mean anomaly: 126.5239 deg
Mean motion: 13.74543749 rev/day
Decay rate: 9.3e-07 rev/day^2
Epoch rev: 17994
Checksum: 337

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94242.58574686

Element set: 724
Inclination: 82.9246 deg
RA of node: 316.2773 deg
Eccentricity: 0.0027677
Arg of perigee: 261.9904 deg
Mean anomaly: 97.8111 deg
Mean motion: 13.74045626 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 17886
Checksum: 349

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94243.05287604
Element set: 275
Inclination: 2.0332 deg
RA of node: 96.0279 deg
Eccentricity: 0.2914017
Arg of perigee: 190.0489 deg
Mean anomaly: 163.3275 deg
Mean motion: 1.42202991 rev/day
Decay rate: -1.07e-06 rev/day^2
Epoch rev: 226
Checksum: 270

/EX
SB KEPS @ AMSAT $ORBS-245.D
Orbital Elements 245.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX September 2, 1994
BID: $ORBS-245.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94242.19112035
Element set: 25
Inclination: 98.5882 deg
RA of node: 325.9562 deg
Eccentricity: 0.0011195
Arg of perigee: 338.6747 deg
Mean anomaly: 21.3973 deg
Mean motion: 14.29853286 rev/day
Decay rate: 1.2e-07 rev/day^2
Epoch rev: 24016
Checksum: 298

Satellite: AO-16
Catalog number: 20439
Epoch time: 94243.22354761
Element set: 823

Inclination: 98.5968 deg
RA of node: 328.2876 deg
Eccentricity: 0.0011378
Arg of perigee: 336.3042 deg
Mean anomaly: 23.7623 deg
Mean motion: 14.29907282 rev/day
Decay rate: 4.0e-08 rev/day^2
Epoch rev: 24032
Checksum: 306

Satellite: DO-17
Catalog number: 20440
Epoch time: 94242.19101324
Element set: 824
Inclination: 98.5966 deg
RA of node: 327.6156 deg
Eccentricity: 0.0011538
Arg of perigee: 338.5461 deg
Mean anomaly: 21.5240 deg
Mean motion: 14.30046939 rev/day
Decay rate: -2.0e-08 rev/day^2
Epoch rev: 24019
Checksum: 279

Satellite: WO-18
Catalog number: 20441
Epoch time: 94243.21721374
Element set: 826
Inclination: 98.5975 deg
RA of node: 328.6270 deg
Eccentricity: 0.0012285
Arg of perigee: 335.7331 deg
Mean anomaly: 24.3277 deg
Mean motion: 14.30021068 rev/day
Decay rate: 6.0e-08 rev/day^2
Epoch rev: 24034
Checksum: 280

Satellite: LO-19
Catalog number: 20442
Epoch time: 94242.28078981
Element set: 822
Inclination: 98.5981 deg
RA of node: 327.9775 deg
Eccentricity: 0.0012453
Arg of perigee: 337.8186 deg
Mean anomaly: 22.2455 deg
Mean motion: 14.30117960 rev/day
Decay rate: 2.0e-08 rev/day^2
Epoch rev: 24022
Checksum: 305

Satellite: UO-22
Catalog number: 21575
Epoch time: 94241.73824273
Element set: 527
Inclination: 98.4306 deg
RA of node: 314.7329 deg
Eccentricity: 0.0008686
Arg of perigee: 70.4243 deg
Mean anomaly: 289.7874 deg
Mean motion: 14.36929130 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 16364
Checksum: 323

Satellite: KO-23
Catalog number: 22077
Epoch time: 94243.11394838
Element set: 422
Inclination: 66.0839 deg
RA of node: 123.1079 deg
Eccentricity: 0.0015430
Arg of perigee: 270.1307 deg
Mean anomaly: 89.7937 deg
Mean motion: 12.86286549 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9642
Checksum: 315

Satellite: AO-27
Catalog number: 22825
Epoch time: 94241.75642219
Element set: 320
Inclination: 98.6479 deg
RA of node: 316.8078 deg
Eccentricity: 0.0009042
Arg of perigee: 359.3250 deg
Mean anomaly: 0.7917 deg
Mean motion: 14.27632689 rev/day
Decay rate: 7.0e-08 rev/day^2
Epoch rev: 4818
Checksum: 319

Satellite: IO-26
Catalog number: 22826
Epoch time: 94243.20374381
Element set: 320
Inclination: 98.6495 deg
RA of node: 318.2912 deg
Eccentricity: 0.0009468
Arg of perigee: 356.6267 deg
Mean anomaly: 3.4849 deg
Mean motion: 14.27737479 rev/day

Decay rate: 3.0e-08 rev/day^2
Epoch rev: 4839
Checksum: 330

Satellite: KO-25
Catalog number: 22830
Epoch time: 94242.21639135
Element set: 326
Inclination: 98.5471 deg
RA of node: 313.7710 deg
Eccentricity: 0.0011188
Arg of perigee: 324.2674 deg
Mean anomaly: 35.7752 deg
Mean motion: 14.28061512 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 4826
Checksum: 287

Satellite: 22828
Catalog number: 22828
Epoch time: 94242.63629114
Element set: 298
Inclination: 98.6425 deg
RA of node: 317.7435 deg
Eccentricity: 0.0010301
Arg of perigee: 343.9905 deg
Mean anomaly: 16.0951 deg
Mean motion: 14.28064245 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 1640
Checksum: 300

/EX

1349. orbs$245.2of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 13:54:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-245.w.1994@ampr.org>
Source record: 27053
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-245.W
Orbital Elements 245.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX September 2, 1994
BID: $ORBS-245.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94243.90509731
Element set: 936
Inclination: 99.0438 deg
RA of node: 295.2545 deg
Eccentricity: 0.0015393
Arg of perigee: 9.1216 deg
Mean anomaly: 351.0235 deg
Mean motion: 14.13638455 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 50095
Checksum: 308

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94243.99550577
Element set: 834
Inclination: 98.5109 deg
RA of node: 250.6891 deg
Eccentricity: 0.0014058
Arg of perigee: 105.3377 deg
Mean anomaly: 254.9360 deg
Mean motion: 14.24902995 rev/day
Decay rate: -1.9e-07 rev/day^2
Epoch rev: 41329
Checksum: 338

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94243.96464040
Element set: 384
Inclination: 82.5398 deg
RA of node: 208.2999 deg
Eccentricity: 0.0016714
Arg of perigee: 334.4143 deg
```

Mean anomaly: 25.6185 deg
Mean motion: 13.84720194 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 33284
Checksum: 316

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94242.15978130
Element set: 319
Inclination: 82.5395 deg
RA of node: 271.3391 deg
Eccentricity: 0.0018506
Arg of perigee: 78.3862 deg
Mean anomaly: 281.9328 deg
Mean motion: 13.16968674 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29299
Checksum: 339

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94243.97944079
Element set: 754
Inclination: 99.1801 deg
RA of node: 234.7722 deg
Eccentricity: 0.0011181
Arg of perigee: 284.4289 deg
Mean anomaly: 75.5640 deg
Mean motion: 14.13012703 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 30584
Checksum: 297

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94242.52167153
Element set: 320
Inclination: 82.5176 deg
RA of node: 84.6624 deg
Eccentricity: 0.0015414
Arg of perigee: 22.2797 deg
Mean anomaly: 337.9045 deg
Mean motion: 13.84371599 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 27797
Checksum: 327

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94244.16711031

Element set: 133
Inclination: 82.5522 deg
RA of node: 217.4430 deg
Eccentricity: 0.0008799
Arg of perigee: 114.5975 deg
Mean anomaly: 245.6092 deg
Mean motion: 13.04420054 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23280
Checksum: 261

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94242.17954897
Element set: 823
Inclination: 82.5491 deg
RA of node: 149.7088 deg
Eccentricity: 0.0015129
Arg of perigee: 305.3559 deg
Mean anomaly: 54.6190 deg
Mean motion: 13.84183191 rev/day
Decay rate: -9.2e-07 rev/day^2
Epoch rev: 21085
Checksum: 328

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94244.29926690
Element set: 57
Inclination: 98.8298 deg
RA of node: 262.0041 deg
Eccentricity: 0.0015864
Arg of perigee: 157.4247 deg
Mean anomaly: 202.7856 deg
Mean motion: 14.01340656 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 20436
Checksum: 315

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94242.57871919
Element set: 832
Inclination: 82.5228 deg
RA of node: 86.7987 deg
Eccentricity: 0.0012377
Arg of perigee: 195.3428 deg
Mean anomaly: 164.7359 deg
Mean motion: 13.83588541 rev/day
Decay rate: 4.0e-07 rev/day^2
Epoch rev: 19804

Checksum: 345

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94242.57520294
Element set: 730
Inclination: 82.5432 deg
RA of node: 117.0195 deg
Eccentricity: 0.0014105
Arg of perigee: 4.7692 deg
Mean anomaly: 355.3559 deg
Mean motion: 13.16464239 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16114
Checksum: 272

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94243.95238147
Element set: 161
Inclination: 98.6135 deg
RA of node: 270.0474 deg
Eccentricity: 0.0013611
Arg of perigee: 20.8464 deg
Mean anomaly: 339.3267 deg
Mean motion: 14.22443392 rev/day
Decay rate: 9.7e-07 rev/day^2
Epoch rev: 17127
Checksum: 290

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94242.51744687
Element set: 736
Inclination: 82.5498 deg
RA of node: 64.2470 deg
Eccentricity: 0.0014156
Arg of perigee: 16.0571 deg
Mean anomaly: 344.0976 deg
Mean motion: 13.16833950 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14624
Checksum: 308

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94243.24645844
Element set: 332
Inclination: 82.5514 deg
RA of node: 146.9692 deg
Eccentricity: 0.0023665

Arg of perigee: 18.4976 deg
Mean anomaly: 341.7038 deg
Mean motion: 13.83014037 rev/day
Decay rate: 8.9e-07 rev/day^2
Epoch rev: 5046
Checksum: 311

/EX
SB KEPS @ AMSAT $ORBS-245.M
Orbital Elements 245.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX September 2, 1994
BID: $ORBS-245.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94243.20371906
Element set: 313
Inclination: 98.6454 deg
RA of node: 318.3232 deg
Eccentricity: 0.0010119
Arg of perigee: 342.4454 deg
Mean anomaly: 17.6372 deg
Mean motion: 14.28038204 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 4840
Checksum: 266

Satellite: MIR
Catalog number: 16609
Epoch time: 94244.20907121
Element set: 734
Inclination: 51.6455 deg
RA of node: 166.0427 deg
Eccentricity: 0.0001744
Arg of perigee: 4.6582 deg
Mean anomaly: 355.4428 deg
Mean motion: 15.56882309 rev/day
Decay rate: 9.259e-05 rev/day^2
Epoch rev: 48786
Checksum: 318

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94243.27512226
Element set: 529
Inclination: 28.4694 deg
RA of node: 113.6263 deg
Eccentricity: 0.0006389
Arg of perigee: 152.2878 deg

Mean anomaly: 207.8028 deg
Mean motion: 14.90661857 rev/day
Decay rate: 3.72e-06 rev/day^2
Epoch rev: 4060
Checksum: 299

Satellite: GRO
Catalog number: 21225
Epoch time: 94241.90549186
Element set: 132
Inclination: 28.4611 deg
RA of node: 80.2748 deg
Eccentricity: 0.0003652
Arg of perigee: 327.2031 deg
Mean anomaly: 32.8347 deg
Mean motion: 15.41184030 rev/day
Decay rate: 1.692e-05 rev/day^2
Epoch rev: 6832
Checksum: 264

Satellite: UARS
Catalog number: 21701
Epoch time: 94241.39185948
Element set: 583
Inclination: 56.9847 deg
RA of node: 225.7000 deg
Eccentricity: 0.0004627
Arg of perigee: 110.7536 deg
Mean anomaly: 249.3995 deg
Mean motion: 14.96472760 rev/day
Decay rate: -2.215e-05 rev/day^2
Epoch rev: 16189
Checksum: 322

/EX

1350. orbs$245.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 13:56:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-245.n.1994@ampr.org>
Source record: 27054
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-245.N
2Line Orbital Elements 245.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX September 2, 1994
BID: $ORBS-245.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 83753
UO-11
1 14781U 84021B 94242.05407815 .00000009 00000-0 94214-5 0 7247
2 14781 97.7858 253.3200 0012823 37.2927 322.9161 14.69239557561151
RS-10/11
1 18129U 87054A 94244.11421328 .00000018 00000-0 35197-5 0 9494
2 18129 82.9230 272.7226 0011490 166.0203 194.1275 13.72340703360321
AO-13
1 19216U 88051B 94244.06465693 -.00000319 00000-0 10000-4 0 9576
2 19216 57.7457 233.4755 7231019 349.2254 1.1276 2.09726877 47609
FO-20
1 20480U 90013C 94242.36051676 .00000014 00000-0 99901-4 0 7201
2 20480 99.0483 20.2052 0540713 171.3929 189.6913 12.83227880213646
AO-21
1 21087U 91006A 94243.59191079 .00000093 00000-0 82657-4 0 5076
2 21087 82.9402 86.9165 0033651 233.2799 126.5239 13.74543749179948
RS-12/13
1 21089U 91007A 94242.58574686 .00000049 00000-0 36517-4 0 7242
2 21089 82.9246 316.2773 0027677 261.9904 97.8111 13.74045626178867
ARSENE
1 22654U 93031B 94243.05287604 -.00000107 00000-0 00000 0 0 2754
2 22654 2.0332 96.0279 2914017 190.0489 163.3275 1.42202991 2266
UO-14
1 20437U 90005B 94242.19112035 .00000012 00000-0 21614-4 0 254
2 20437 98.5882 325.9562 0011195 338.6747 21.3973 14.29853286240161
AO-16
1 20439U 90005D 94243.22354761 .00000004 00000-0 18510-4 0 8233
```

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2 20439 98.5968 328.2876 0011378 336.3042 23.7623 14.29907282240320
DO-17
1 20440U 90005E 94242.19101324 -.00000002 00000-0 16333-4 0 8246
2 20440 98.5966 327.6156 0011538 338.5461 21.5240 14.30046939240192
WO-18
1 20441U 90005F 94243.21721374 .00000006 00000-0 19210-4 0 8266
2 20441 98.5975 328.6270 0012285 335.7331 24.3277 14.30021068240340
LO-19
1 20442U 90005G 94242.28078981 .00000002 00000-0 17882-4 0 8227
2 20442 98.5981 327.9775 0012453 337.8186 22.2455 14.30117960240227
UO-22
1 21575U 91050B 94241.73824273 .00000035 00000-0 26496-4 0 5277
2 21575 98.4306 314.7329 0008686 70.4243 289.7874 14.36929130163642
KO-23
1 22077U 92052B 94243.11394838 -.00000037 00000-0 10000-3 0 4221
2 22077 66.0839 123.1079 0015430 270.1307 89.7937 12.86286549 96423
AO-27
1 22825U 93061C 94241.75642219 .00000007 00000-0 20508-4 0 3208
2 22825 98.6479 316.8078 0009042 359.3250 0.7917 14.27632689 48182
IO-26
1 22826U 93061D 94243.20374381 .00000003 00000-0 19182-4 0 3205
2 22826 98.6495 318.2912 0009468 356.6267 3.4849 14.27737479 48394
KO-25
1 22830U 93061H 94242.21639135 -.00000008 00000-0 14107-4 0 3265
2 22830 98.5471 313.7710 0011188 324.2674 35.7752 14.28061512 48269
22828
1 22828U 93061F 94242.63629114 .00000021 00000-0 26070-4 0 2988
2 22828 98.6425 317.7435 0010301 343.9905 16.0951 14.28064245 16405
NOAA-9
1 15427U 84123A 94243.90509731 .00000057 00000-0 54633-4 0 9361
2 15427 99.0438 295.2545 0015393 9.1216 351.0235 14.13638455500954
NOAA-10
1 16969U 86073A 94243.99550577 -.00000019 00000-0 10011-4 0 8340
2 16969 98.5109 250.6891 0014058 105.3377 254.9360 14.24902995413293
MET-2/17
1 18820U 88005A 94243.96464040 .00000032 00000-0 15058-4 0 3841
2 18820 82.5398 208.2999 0016714 334.4143 25.6185 13.84720194332842
MET-3/2
1 19336U 88064A 94242.15978130 .00000051 00000-0 10000-3 0 3199
2 19336 82.5395 271.3391 0018506 78.3862 281.9328 13.16968674292991
NOAA-11
1 19531U 88089A 94243.97944079 .00000023 00000-0 37681-4 0 7546
2 19531 99.1801 234.7722 0011181 284.4289 75.5640 14.13012703305844
MET-2/18
1 19851U 89018A 94242.52167153 .00000045 00000-0 26655-4 0 3206
2 19851 82.5176 84.6624 0015414 22.2797 337.9045 13.84371599277972
MET-3/3
1 20305U 89086A 94244.16711031 .00000044 00000-0 10000-3 0 1336
2 20305 82.5522 217.4430 0008799 114.5975 245.6092 13.04420054232808
MET-2/19
```

```
1 20670U 90057A 94242.17954897 -.00000092 00000-0 -95401-4 0 8239
2 20670 82.5491 149.7088 0015129 305.3559 54.6190 13.84183191210851
FY-1/2
1 20788U 90081A 94244.29926690 -.00000027 00000-0 10000-4 0 579
2 20788 98.8298 262.0041 0015864 157.4247 202.7856 14.01340656204365
MET-2/20
1 20826U 90086A 94242.57871919 .00000040 00000-0 22455-4 0 8321
2 20826 82.5228 86.7987 0012377 195.3428 164.7359 13.83588541198047
MET-3/4
1 21232U 91030A 94242.57520294 .00000050 00000-0 10000-3 0 7300
2 21232 82.5432 117.0195 0014105 4.7692 355.3559 13.16464239161146
NOAA-12
1 21263U 91032A 94243.95238147 .00000097 00000-0 62726-4 0 1614
2 21263 98.6135 270.0474 0013611 20.8464 339.3267 14.22443392171273
MET-3/5
1 21655U 91056A 94242.51744687 .00000051 00000-0 10000-3 0 7362
2 21655 82.5498 64.2470 0014156 16.0571 344.0976 13.16833950146246
MET-2/21
1 22782U 93055A 94243.24645844 .00000089 00000-0 67543-4 0 3329
2 22782 82.5514 146.9692 0023665 18.4976 341.7038 13.83014037 50463
POSAT
1 22829U 93061G 94243.20371906 .00000005 00000-0 19698-4 0 3134
2 22829 98.6454 318.3232 0010119 342.4454 17.6372 14.28038204 48405
MIR
1 16609U 86017A 94244.20907121 .00009259 00000-0 13297-3 0 7346
2 16609 51.6455 166.0427 0001744 4.6582 355.4428 15.56882309487868
HUBBLE
1 20580U 90037B 94243.27512226 .00000372 00000-0 21862-4 0 5297
2 20580 28.4694 113.6263 0006389 152.2878 207.8028 14.90661857 40605
GRO
1 21225U 91027B 94241.90549186 .00001692 00000-0 33530-4 0 1328
2 21225 28.4611 80.2748 0003652 327.2031 32.8347 15.41184030 68322
UARS
1 21701U 91063B 94241.39185948 -.00002215 00000-0 -17257-3 0 5833
2 21701 56.9847 225.7000 0004627 110.7536 249.3995 14.96472760161892
/EX
```

1351. DSP-2232/PACSAT Users

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 14:22:59 UTC
From: marcoh@world.std.com
Message-ID: <CvIAMD.2D9@world.std.com>
Source record: 27055

--

If you have an AEA DSP-2232 and you are active on the PACSATs,
I would like to hear from you!

I've worked terrestrial packet for some time, but I have only recently given working the PACSATs a try (after much trial and error, I recently downloaded a file from AO-16 for the first time). I am looking for insights into optimal use of a 2232 with satellites, especially AEA upgrades, hardware and software mods, and tips and techniques you found particularly useful. Also, if there is a 2232 UG/mailing list/forum, I'd like to know how to join/subscribe.

I seldom get onto UseNet, but if you have the time and inclination for direct email, you can reach me at:

marcoh@world.std.com
n1mae@amsat.org
n1mae@switch.lmnstr.ampr.org

mny tks et 73 de n1mae

Mark "Marco" Heroux

1352. STS-64 Element Set (94253.100)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 20:45:58 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94253.100@alsys.com>
Source record: 27058
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 00064U 94253.10081701 .00083204 00000-0 14200-3 0 90
2 00064 57.0058 195.1863 0009244 269.5211 90.4820 16.05202670 52

Satellite: STS-64
Catalog number: 00064
Epoch time: 94253.10081701 = (10 SEP 94 02:25:10.58 UTC)
Element set: 009
Inclination: 57.0058 deg
RA of node: 195.1863 deg Space Shuttle Flight STS-64
Eccentricity: .0009244 Prelaunch element set JSC-009
Arg of perigee: 269.5211 deg Launch: 09 SEP 20:30:00 UTC
Mean anomaly: 90.4820 deg
Mean motion: 16.05202670 rev/day Gil Carman
Decay rate: 8.3204e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 5

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1353. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 23:06:15 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.778547175@afit.af.mil>
Source record: 27056
Cross-posted to: rec.radio.amateur.space,rec.radio.info

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space and rec.radio.amateur.misc on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated several times weekly. Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (updated weekly) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAAAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a twenty-two-character name (this change is being made to be consistent with the name length in the NORAD SATCAT).

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1354. Two-Line Orbital Element Sets (TLE461)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-02 23:08:18 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.778547298@afit.af.mil>
Source record: 27057

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #461 -
Alouette 1
1 00424U 62049 94238.05638797 .00000055 00000-0 54275-4 0 259
2 00424 80.4616 216.0603 0022281 298.0810 61.8079 13.67817340591958
ATS 1
1 02608U 66110A 94241.63069388 -.00000296 00000-0 10000-3 0 9018
2 02608 14.5855 359.6967 0009970 49.7624 108.1154 1.00350534 18200
ATS 3
1 03029U 67111A 94243.75152913 -.00000113 00000-0 10000-3 0 2426
2 03029 14.6992 6.7296 0009656 263.2738 235.0099 1.00272789 98195
Cosmos 398
1 04966U 71016A 94244.15109327 .00076113 68699-5 14247-3 0 4707
2 04966 51.4489 27.7272 0956466 232.3769 118.6578 14.04736435783363
Starlette
1 07646U 75010A 94238.28318395 -.00000127 00000-0 11132-4 0 8117
2 07646 49.8273 236.7442 0206106 207.7499 151.2272 13.82187173987543
LAGEOS
1 08820U 76039A 94243.11273591 -.00000013 00000-0 10000-3 0 297
2 08820 109.8235 161.2587 0044166 268.8401 90.7900 6.38664297171935
ETS-2
1 09852U 77014A 94238.45229087 -.00000259 00000-0 10000-3 0 9818
2 09852 12.2725 40.6732 0003229 66.8433 318.3282 1.00004000 11030
GOES 2
1 10061U 77048A 94243.33183020 .00000068 00000-0 00000+0 0 3982
2 10061 11.3368 44.8108 0003236 52.9668 226.2218 1.00258791 7864
IUE
1 10637U 78012A 94243.60262255 -.00000246 00000-0 10000-3 0 364
2 10637 34.7274 93.6823 1318358 38.2202 10.9898 1.00244107 13483
GPS BI-01
1 10684U 78020A 94238.41313766 -.00000027 00000-0 10000-3 0 2945
2 10684 64.6871 43.4315 0062522 163.5099 196.7019 1.98069604106321
```

```
GPS BI-02
1 10893U 78047A 94243.14406775 .00000032 00000-0 10000-3 0 971
2 10893 63.4912 282.0143 0215166 14.0487 346.6201 2.01627581119581
GOES 3
1 10953U 78062A 94243.30487987 .00000044 00000-0 10000-3 0 3625
2 10953 10.2779 47.5859 0005970 70.9086 152.3467 1.00265417 12473
SeaSat 1
1 10967U 78064A 94242.20730551 -.00000075 00000-0 19934-4 0 3214
2 10967 107.9990 255.3982 0002008 241.2269 118.8670 14.37974286847001
GPS BI-03
1 11054U 78093A 94239.04616872 -.00000004 00000-0 10000-3 0 2137
2 11054 63.1858 279.6569 0044935 177.7662 182.3255 1.93505575115888
Nimbus 7
1 11080U 78098A 94242.20975582 -.00000093 00000-0 -45735-4 0 4257
2 11080 99.0444 123.0367 0008524 297.4527 62.5760 13.83726740800318
GPS BI-04
1 11141U 78112A 94243.01347393 .00000011 00000-0 00000+0 0 9136
2 11141 64.6861 44.6414 0048196 27.0753 333.2214 1.92895484 5223
GPS BI-05
1 11690U 80011A 94242.70371583 .00000011 00000-0 10000-3 0 8290
2 11690 65.0483 45.0488 0142048 195.8516 163.7322 2.00557786121039
GPS BI-06
1 11783U 80032A 94240.24716718 .00000014 00000-0 10000-3 0 22
2 11783 62.6282 275.7915 0211823 29.1186 332.1479 2.03457643105423
GOES 5
1 12472U 81049A 94239.81697901 -.00000046 00000-0 10000-3 0 7898
2 12472 6.9737 57.2499 0006661 21.2878 75.6317 1.00337165 6486
Cosmos 1383
1 13301U 82066A 94238.09645054 .00000024 00000-0 10535-4 0 3234
2 13301 82.9289 258.4963 0025911 263.1647 96.6555 13.68057290606988
LandSat 4
1 13367U 82072A 94244.21578442 .00000023 00000-0 15154-4 0 5288
2 13367 98.1737 301.3594 0007824 25.3396 334.8185 14.57126571645131
IRAS
1 13777U 83004A 94243.49926603 -.00000291 00000-0 -17080-3 0 6980
2 13777 98.9730 72.8880 0012610 106.0832 254.1719 13.99207285261673
Cosmos 1447
1 13916U 83021A 94241.72758277 .00000036 00000-0 22202-4 0 4254
2 13916 82.9476 317.3101 0037185 182.1640 177.9361 13.74313268573434
TDRS 1
1 13969U 83026B 94243.89957337 -.00000194 00000-0 10000-3 0 3342
2 13969 7.8454 50.3105 0008807 91.9175 246.2028 1.00264697 14809
GOES 6
1 14050U 83041A 94244.14537319 .00000036 00000-0 10000-3 0 2606
2 14050 5.7720 60.2568 0003719 4.5214 201.0048 1.00235112 13549
OSCAR 10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
LandSat 5
1 14780U 84021A 94244.18422268 -.00000007 00000-0 83606-5 0 1203
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2 14780 98.1561 302.4078 0005627 33.2495 326.9056 14.57138658558548
UoSat 2
1 14781U 84021B 94242.05407815 .00000009 00000-0 94214-5 0 7247
2 14781 97.7858 253.3200 0012823 37.2927 322.9161 14.69239557561151
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94242.29765550 .00000035 00000-0 21166-4 0 6250
2 15055 82.9562 10.3853 0028219 13.2526 346.9371 13.73609489510808
GPS BI-10
1 15271U 84097A 94243.42571321 .00000044 00000-0 10000-3 0 8453
2 15271 62.3303 275.8308 0148001 349.6252 10.1608 2.00585628 72116
Cosmos 1602
1 15331U 84105A 94242.85980704 .00000199 00000-0 20751-4 0 3164
2 15331 82.5323 7.7947 0019582 321.8084 38.1742 14.84448025535595
NOAA 9
1 15427U 84123A 94243.90509731 .00000057 00000-0 54633-4 0 9361
2 15427 99.0438 295.2545 0015393 9.1216 351.0235 14.13638455500954
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94244.20907121 .00009259 00000-0 13297-3 0 7346
2 16609 51.6455 166.0427 0001744 4.6582 355.4428 15.56882309487868
SPOT 1
1 16613U 86019A 94243.24129880 .00000090 00000-0 62356-4 0 7192
2 16613 98.6823 315.5404 0001341 33.3154 326.8106 14.20366697127218
Cosmos 1766
1 16881U 86055A 94238.03891852 .00000202 00000-0 21560-4 0 2300
2 16881 82.5176 70.2958 0020085 2.3073 357.8230 14.83474895435818
EGP
1 16908U 86061A 94238.27209186 -.00000097 00000-0 00000+0 0 9228
2 16908 50.0097 228.9352 0011802 135.6747 224.5046 12.44410455 34115
NOAA 10
1 16969U 86073A 94243.99550577 -.00000019 00000-0 10011-4 0 8340
2 16969 98.5109 250.6891 0014058 105.3377 254.9360 14.24902995413293
MOS-1
1 17527U 87018A 94243.22728522 .00000091 00000-0 99794-4 0 1161
2 17527 99.0279 310.3191 0001526 45.1516 314.9769 13.94907460383404
GOES 7
1 17561U 87022A 94243.62245630 -.00000052 00000-0 10000-3 0 9935
2 17561 1.7071 74.8055 0003747 1.7517 14.4191 1.00273954 10731
Kvant-1
1 17845U 87030A 94244.08076642 -.00006767 00000-0 -85714-4 0 9671
2 17845 51.6461 166.6857 0001611 7.0364 353.4598 15.56866170487931
DMSP B5D2-3
1 18123U 87053A 94243.93503760 .00000012 00000-0 28455-4 0 6272
2 18123 98.7859 74.5117 0014197 329.0551 30.9795 14.15369650371807
RS-10/11
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1 18129U 87054A 94244.11421328 .00000018 00000-0 35197-5 0 9494
2 18129 82.9230 272.7226 0011490 166.0203 194.1275 13.72340703360321
Meteor 2-16
1 18312U 87068A 94243.27076381 .00000065 00000-0 45663-4 0 3230
2 18312 82.5571 152.3183 0010904 265.6880 94.3034 13.84036492355441
Meteor 2-17
1 18820U 88005A 94243.96464040 .00000032 00000-0 15058-4 0 3841
2 18820 82.5398 208.2999 0016714 334.4143 25.6185 13.84720194332842
DMSP B5D2-4
1 18822U 88006A 94244.07097726 .00000002 00000-0 19104-4 0 7375
2 18822 98.4334 95.8679 0006447 110.8315 249.3555 14.23114907341393
Glonass 34
1 19163U 88043A 94236.93197414 .00000000 00000-0 10000-3 0 9203
2 19163 65.0568 108.1369 0006935 140.3520 219.7941 2.13102456 48120
Glonass 36
1 19165U 88043C 94241.68038457 .00000004 00000-0 10000-3 0 3145
2 19165 65.0288 107.9392 0002817 321.6229 38.4499 2.13102273 48849
METEOSAT 3
1 19215U 88051A 94241.68884198 -.00000263 00000-0 10000-3 0 9808
2 19215 1.8886 71.8542 0000522 123.5134 315.5599 1.00280919 10655
AO-13
1 19216U 88051B 94244.06465693 -.00000319 00000-0 10000-4 0 9576
2 19216 57.7457 233.4755 7231019 349.2254 1.1276 2.09726877 16100
OKEAN 1
1 19274U 88056A 94243.27442871 .00000193 00000-0 21165-4 0 9326
2 19274 82.5152 165.4150 0021081 118.5199 241.8141 14.82206774332208
Meteor 3-2
1 19336U 88064A 94242.15978130 .00000051 00000-0 10000-3 0 3199
2 19336 82.5395 271.3391 0018506 78.3862 281.9328 13.16968674292991
Glonass 39
1 19503U 88085C 94241.23750862 -.00000069 00000-0 10000-3 0 2173
2 19503 65.7672 346.8936 0006993 167.7923 192.2625 2.13102077 46329
NOAA 11
1 19531U 88089A 94243.97944079 .00000023 00000-0 37681-4 0 7546
2 19531 99.1801 234.7722 0011181 284.4289 75.5640 14.13012703305844
TDRS 2
1 19548U 88091B 94243.36881264 .00000090 00000-0 10000-3 0 9963
2 19548 1.1728 76.6926 0002012 21.3839 202.8841 1.00279534 8953
Glonass 40
1 19749U 89001A 94231.89152019 .00000013 00000-0 10000-3 0 4221
2 19749 65.0063 107.8848 0006733 239.5620 120.4743 2.13101397 43638
Glonass 41
1 19750U 89001B 94242.74076481 .00000016 00000-0 10000-3 0 3229
2 19750 65.0072 107.5942 0007097 283.6420 76.3667 2.13102037 43887
GPS BII-01
1 19802U 89013A 94241.02081180 -.00000028 00000-0 10000-3 0 9468
2 19802 55.1277 136.8357 0031121 176.7331 183.3420 2.00557567 40516
Akebono
1 19822U 89016A 94238.19802236 .00005032 00000-0 26353-3 0 3168
2 19822 75.1122 143.0208 3817563 239.4003 77.6077 7.78899738114741
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Meteor 2-18
1 19851U 89018A 94238.11286371 .00000057 00000-0 37638-4 0 3194
2 19851 82.5178 88.1788 0015481 34.2843 325.9312 13.84371452277368
MOP-1
1 19876U 89020B 94235.16877315 -.00000090 00000-0 10000-3 0 547
2 19876 0.5889 66.3303 0001586 67.8332 249.5795 1.00272944 834
TDRS 3
1 19883U 89021B 94232.91003067 -.00000292 00000-0 00000+0 0 9707
2 19883 0.0425 85.4709 0002291 213.6173 316.3607 1.00265692192449
GPS BII-02
1 20061U 89044A 94243.35567867 -.00000053 00000-0 10000-3 0 9581
2 20061 54.6025 313.3700 0135643 209.7424 149.5482 2.00565315 38304
Nadezhda 1
1 20103U 89050A 94243.97005001 .00000021 00000-0 60736-5 0 1040
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GPS BIIA-24
1 23027U 94016A 94238.64267071 -.00000077 00000-0 00000+0 0 909
2 23027 54.9273 16.7039 0072119 185.8422 174.2611 2.00563476 3459
Glonass 62
1 23043U 94021A 94243.05086660 -.00000068 00000-0 00000+0 0 907
2 23043 64.8055 346.7641 0007329 185.7707 174.2522 2.13103154 3027
Glonass 63
1 23044U 94021B 94243.40299072 -.00000067 00000-0 00000+0 0 752
2 23044 64.7957 346.7535 0030665 202.1848 157.7049 2.13103108 3039
Glonass 64
1 23045U 94021C 94243.10933792 -.00000068 00000-0 00000+0 0 935
2 23045 64.7932 346.7841 0009558 37.9434 322.1520 2.13103665 3024
GOES 8
1 23051U 94022A 94241.23127020 -.00000192 00000-0 00000+0 0 1641
2 23051 0.2956 265.5933 0002794 293.3092 131.6738 1.00271396 1029
MSTI 2
1 23101U 94028A 94241.53046592 .00003145 00000-0 64012-4 0 692
2 23101 97.1132 74.4139 0011577 231.2872 128.7337 15.46957435 17385
STRV-1A
1 23125U 94034B 94233.46510864 .00000111 00000-0 13578-3 0 337
2 23125 6.9526 158.6649 7285568 230.9948 38.5794 2.27333791 1495
STRV-1B
1 23126U 94034C 94238.86368415 .00000513 00000-0 20799-3 0 362
2 23126 6.9163 156.5525 7288268 235.1895 34.2412 2.26939108 1618
Soyuz TM-19
1 23139U 94036A 94244.08076642 -.00006767 00000-0 -85714-4 0 725
2 23139 51.6461 166.6857 0001611 7.0364 353.4598 15.56866170 9619
Nadezhda 4
1 23179U 94041A 94238.33502924 .00000018 00000-0 23343-5 0 208
2 23179 82.9443 6.3756 0035310 167.5700 192.6330 13.75656688 5935
Cosmos 2285
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1 23189U 94045A 94244.21077873 .00000005 00000-0 30631-4 0 198
2 23189 74.0289 210.9528 0026173 213.2113 146.7363 13.71651106 4032
1994045B
1 23190U 94045B 94243.30183034 .00000118 00000-0 15145-3 0 250
2 23190 74.0211 212.3202 0021900 204.5565 155.4512 13.73296322 3917
APEX
1 23191U 94046A 94238.09851336 .00001255 00000-0 10671-3 0 206
2 23191 69.9709 205.6663 1393089 133.9841 238.4956 12.52732823 2833
DIRECTV
1 23192U 94047A 94239.59774023 -.00000114 00000-0 00000+0 0 262
2 23192 0.0522 135.1322 0003551 27.0619 286.3317 1.00239116 298
1994047B
1 23193U 94047B 94238.99164277 .00014410 00000-0 24473-2 0 165
2 23193 26.9096 123.8830 7466952 191.4155 129.7109 2.06511167 493
Cosmos 2286
1 23194U 94048A 94240.97817592 -.00000637 00000-0 35316-2 0 214
2 23194 62.9150 277.3828 7378024 316.4578 4.9518 2.00683029 496
1994048B
1 23195U 94048B 94244.27088340 .00234365 76949-5 43211-3 0 358
2 23195 62.8245 178.7334 0181062 121.0790 240.8365 15.77677605 4283
1994048C
1 23196U 94048C 94244.29055338 .01832779 82100-5 62908-3 0 626
2 23196 62.8319 177.1041 0118028 122.9886 238.2677 16.09862629 4311
1994048D
1 23197U 94048D 94244.08191927 -.00001429 00000-0 -22164-2 0 173
2 23197 62.8964 276.8631 7350001 316.4505 5.0558 2.03854197 554
1994046B
1 23198U 94046B 94240.33466200 .00000859 00000-0 75575-4 0 164
2 23198 69.9751 201.8117 1392068 131.6814 241.2100 12.52715051 3119
BrazilSat
1 23199U 94049A 94234.48639119 -.00000308 00000-0 10000-3 0 259
2 23199 0.0531 329.1197 0012768 287.2890 188.4214 1.00285653 195
1994049B
1 23200U 94049B 94233.67242538 .00000091 00000-0 00000+0 0 294
2 23200 0.0871 257.6072 0019217 136.7020 219.3453 1.00582040 123
1994049C
1 23201U 94049C 94242.78380166 .00000020 00000-0 35104-3 0 140
2 23201 6.9662 114.3341 7312181 193.9659 121.9176 2.18778438 387
1994049D
1 23202U 94049D 94236.67604090 .00038298 00000-0 52393-2 0 211
2 23202 7.0609 115.4749 7281875 189.7393 139.9258 2.29659521 257
Glonass 65
1 23203U 94050A 94241.83912056 .00000076 00000-0 00000+0 0 322
2 23203 64.8421 226.2296 0006943 163.7716 196.2576 2.13104852 393
Glonass 66
1 23204U 94050B 94243.48149460 .00000072 00000-0 00000+0 0 402
2 23204 64.8225 226.2068 0014930 339.0713 21.0277 2.13095568 423
Glonass 67
1 23205U 94050C 94241.48708291 .00000075 00000-0 00000+0 0 340
2 23205 64.8389 226.2605 0003405 283.2173 76.7600 2.13102699 383
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1994050F
1 23208U 94050F 94241.92720309 .00000076 00000-0 00000+0 0 145
2 23208 64.8441 226.2298 0012109 283.0046 76.8757 2.13429579 373
1994050G
1 23209U 94050G 94241.89445200 .00000103 00000-0 00000+0 0 114
2 23209 64.8930 220.0307 5795323 296.6748 16.1101 4.23182710 668
1994050H
1 23210U 94050H 94240.00464895 .00000079 00000-0 00000+0 0 111
2 23210 64.8239 220.8599 5795475 296.7422 16.0909 4.23166247 584
1994051A
1 23211U 94051A 94243.49909351 -.00029924 00000-0 -51638+0 0 137
2 23211 62.8166 138.0688 7367339 288.3840 9.4394 2.01147331 174
1994051B
1 23212U 94051B 94243.08958841 .00208544 74272-5 44988-3 0 115
2 23212 62.8296 111.6676 0246831 123.2424 239.2661 15.62147353 1170
1994051C
1 23213U 94051C 94244.05496139 .00559638 74637-5 55124-3 0 157
2 23213 62.8141 108.1099 0281481 120.7623 242.1680 15.64335521 1322
1994051D
1 23214U 94051D 94237.11737476 .00000324 00000-0 10000-4 0 10
2 23214 62.8258 138.9933 7327174 288.2949 14.0466 2.06165762 44
1994052A
1 23215U 94052A 94244.20883021 .00081093 00000-0 10883-2 0 343
2 23215 51.6486 166.0261 0002271 329.8670 30.2189 15.57222139 1038
1994052B
1 23216U 94052B 94239.73334392 .14573584 12556-4 14483-3 0 124
2 23216 51.6166 187.8188 0010919 134.6131 229.6921 16.50221201 350
1994051E
1 23217U 94051E 94243.72872808 .09313961 80266-5 33086-2 0 125
2 23217 62.7003 108.7785 0093588 126.0787 239.4347 16.14147635 1286
1994053A
1 23218U 94053A 94244.21325491 .00137290 71674-5 11737-3 0 138
2 23218 64.8115 169.0235 0057690 69.4607 291.2791 16.09489197 924
1994053B
1 23219U 94053B 94244.20223873 .00338764 72155-5 23278-3 0 136
2 23219 64.8477 169.0219 0046732 72.3530 288.2756 16.13576880 930
1994053C
1 23220U 94053C 94244.23032567 .00482397 65954-5 75416-3 0 85
2 23220 64.7543 169.8214 0221720 88.3136 274.3490 15.71666781 898
1994053D
1 23221U 94053D 94243.20468464 .00503179 65549-5 77928-3 0 38
2 23221 64.8731 173.9971 0214595 89.2374 273.3330 15.73265754 733
1994053E
1 23222U 94053E 94240.99559667 .00393369 63723-5 80501-3 0 39
2 23222 64.8709 181.8750 0259605 68.0445 294.8215 15.60163737 382
1994053F
1 23224U 94053F 94241.84082504 .04479178 75442-5 97185-3 0 53
2 23224 64.7542 177.8960 0038294 75.9891 285.1974 16.27829113 541
1994053G
1 23225U 94053G 94244.15883182 .00206210 26474-4 25458-3 0 80
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2 23225 64.8316 169.3173 0025369 343.4588 16.5679 16.06948776 934
1994053H
1 23226U 94053H 94244.11925311 .00490908 65443-5 88594-3 0 65
2 23226 64.7498 170.3207 0234189 68.3715 294.2078 15.67171211 871
1994055A
1 23227U 94055A 94243.19448806 .00228339 00000-0 49812+0 0 59
2 23227 24.0851 327.8566 7408744 180.9031 175.7310 2.06477967 70
1994055B
1 23228U 94055B 94244.27112056 .00269991 -60256-5 45389-3 0 69
2 23228 27.8737 302.4656 0629917 171.7254 189.4273 14.79417906 642
1994055C
1 23229U 94055C 94241.26270554 .00006007 00000-0 12794-1 0 46
2 23229 24.0321 328.5625 7411573 179.7622 181.0360 2.06440064 33
1994056A
1 23230U 94056A 94242.78393696 .00059211 00000-0 19621+0 0 83
2 23230 27.6577 128.9816 7242676 181.3774 174.1287 2.24140814 68
1994056B
1 23231U 94056B 94241.33492425 .00000580 40043-6 10000-4 0 27
2 23231 28.5723 129.5007 7109873 177.2128 191.6323 2.55798450 30
1994057A
1 23233U 94057A 94254.45955914 .00000217 00000-0 14135-3 0 71
2 23233 98.9195 309.5091 0012036 202.3641 157.7129 14.12532263 1814
1994057B
1 23234U 94057B 94244.11805863 -.00000026 00000-0 10000-4 0 45
2 23234 98.9200 299.2160 0008342 189.6084 170.4698 14.12347812 352
1994057C
1 23235U 94057C 94244.11796733 .00030630 00000-0 16549-1 0 34
2 23235 98.9218 299.2129 0008520 186.6886 173.4209 14.12439860 358
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Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1355. WISP

Newsgroup: rec.radio.amateur.space
Date: 1994-09-03 17:48:26 UTC
From: GerryP@Interlink.NET
Message-ID: <GerryP.3.0011CF30@Interlink.NET>
Source record: 27059

I have recently learned that there is a new satellite tracking or telemetry decoding software called WISP. Could anyone tell me where I can find this software and what is it used for ? 73 de Gerry, VE2AW

1356. WWW Site?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-04 05:49:10 UTC
From: phulse@netcom.com
Message-ID: <phulseCvLC5z.17K@netcom.com>
Source record: 27060

I heard that AMSAT has a WWW site. Does anyone have the address of it?

Thanks.

```
Paul B. Hulse _______________________________
KK6JD PACKET: KK6JD@K6VE.#SOCAL.CA.USA.NA | Warner Brothers Studios |
Lambda Amateur Radio Club | Burbank, California |
Internet: phulse@netcom.com | Production Sound Engineer |
| -----------------------------|
PBS: No More Tales - No More Pledge Money | Opinions Expressed are MINE |
| and NOT those of my employer!|
|______________________________|
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Paul B. Hulse _______________________________
KK6JD PACKET: KK6JD@K6VE.#SOCAL.CA.USA.NA | Warner Brothers Studios |
Lambda Amateur Radio Club | Burbank, California |
Internet: phulse@netcom.com | Production Sound Engineer |
| -----------------------------|
PBS: No More Tales - No More Pledge Money | Opinions Expressed are MINE |
| and NOT those of my employer!|
|______________________________|
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1357. Sept VHF QSO Party 9/10 - 9/12 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-09-04 18:57:00 UTC
From: tim.marek@megasystem.com
Message-ID: <215.367.1443.0NA708BB@megasystem.com>
Source record: 26961

Fellow VHF Contesters...
NC7K - Tim
Will be QRV once again from 8100 FT. Pond Peak here in DM09 (Near Reno).
With access to 110V AC power I'm bringing the 4CX250B amp for 144 Mhz.
Stations will be as follows....
50 Mhz - FT-620B driving N4LTA 100W brick into 4 ele Homebrew K6STI
144 Mhz - TS770 Driving single 4CX250B to 350W into 12 ele NBS Yagi
432 Mhz - TS770 driving RFC 110W brick into 16 ele NBS yagi
3.818 Mhz HF for Liason. SKEDS, SKEDS, SKEDS !!!
For the Locals without CW/SSB I will have 146.55 and 446.00 FM.
I'm open to any skeds from Tropo to Random Meteors Sunday morning.
Needing 11 grids to finish 432 VUCC I'm especially looking for UHF Qs
from N.CA, UT, ID, and OR. Another goal is to finally work AZ on 2M
Tropo from here. Is anyone down that way going to be portable in the
N.W. corner of the state?
Heres to NO SNOW or WIND! HI!! 73s and CUL on the air. sk
de Tim.Marek@Megasystem.Com

1358. ANS-246 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-09-05 00:30:35 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-246.01.1994@ampr.org>
Source record: 26962
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-246.01
WISP DOWNLOAD STEPS FROM DRIG

HR AMSAT NEWS SERVICE BULLETIN 246.01 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 3, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-246.01

How To Download The AMSAT WISP MICROSAT Telemetry Program

The Dallas Remote Imaging Group (DRIG) BBS will carry the latest updates
to the WISP Microsat packet radio programs on the system. Roy Welch (W0SL)
will be uploading both the entire package and the Dynamic Link Library (DLL)
updates to DRIG as soon as the executables are available.

The WISP files will be available to all users, even brand new members who
have not yet fully registered.

To find the latest version, log on to the DRIG BBS in Dallas at:
214-394-7438

Your communications program parameters should be:
28.8Kbps to 2400 bps (1200 is too slow and not supported)

N parity
8 data bits
1 stop bit

Log on and if you are a new user, answer Yes to Register with us (if you
answer no, you will not be able to download files). Answer the requested
information (type in your own first name, last name, password, city, state,
full address, telephone, etc) for our database for any new mailings or
postings you would be interested in.

>From the Main Menu, do the following:

Z WISP 7

The Z is a Zippy search to find the character string WISP

7 is the Microsat telemetry program files area

A listing of all of the WISP programs in File Areas 7 (Microsats)
will be displayed.

Picked the NEWEST one by the name WISPNEW.ZIP

Pick up only the latest changes by the name WISPUPDT.ZIP

Use Zmodem or any other binary protocol to download!

You may download the file from the Main menu by typing the
following:

D WISPNEW.ZIP (type in this WISP filename for a new complete file)
D WISPUPDT.ZIP (type in this WISP filename for the lastest updates only)

If it asks for a Protocol, the fastest is Zmodem (xmodem, ymodem, kermit,
also work o.k.)

The system will come back with a listing of files you want to download.
Just hit enter, and if you want to log off immediately after the download
is complete, simply type G for goodbye in the command line when asked.

==========

BULLET90 is the file to download for NASA 2-line Keps (updated weekly)

BULLET93 is the file to download for AMSAT style keps (updated weekly)

If you get industrious, also download the DRIG informatin file:
DRIGINFO.ZIP and DRIGLIST.ZIP which is a COMPLETE listing of all
7 gigabytes of files on the DRIG BBS! And of course, any problems, simply
enter C for Comment to Sysop and will will be glady to help you out!

Dallas Remote Imaging Group
Satellite Imagery BBS
214-394-7438
info@drig.com
1:124/6509

Voice 214-394-7325
FAX 214-492-7747
BBS 214-394-7438

Internet FTP and Telnet 56Kbps lines are being installed in November
for direct access over the Internet!

/EX
SB SAT @ AMSAT $ANS-246.01
AMSAT-NA SPACE SYMPOSIUM AGENDA

HR AMSAT NEWS SERVICE BULLETIN 246.01 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 3, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-246.01

AMSAT-NA Space Symposium & Annual Meeting Scheduled For 7-9 Oct '94

1994 AMSAT-NA Annual Meeting
and Space Symposium
Holiday Inn, Orlando International Airport, Florida
October 7-9, 1994

Friday, October 7, 1994
11:00 - 5:00 PM Registration - International Ballroom Entrance
1:00 - 5:00 PM Session A - Mission Status Briefings - International Ballroom
1:00 - 1:30 PM Frank Bauer: "SAREX Update '94"
1:30 - 2:00 PM Joan Freeman KD4SRD: "A SAREX Case Study"
2:00 - 2:45 PM Dennis Wingo KD4ETA: "SEDSAT1 Update SEDSAT2; Amateur
Radio in Lunar Orbit"
2:45 - 3:00 AM Break
3:00 - 3:30 PM Dan Schultz N8FGV: "Hubble Space Telescope Photographs"
3:30 - 4:00 PM Robert Diersing N5AHD: "DOVE Back On the Air"
4:00 - 4:30 PM David Liberman XE1TU: "UNAMSAT: An Operational Guide"
4:30 - 5:00 PM Philip Chien KC4YER: "Launch Opportunities Beyond Phase-3D"

Saturday, October 8, 1994
7:30 - 8:00 AM Registration - International Ballroom Entrance
8:00 - 11:45 AM Session B - Orbital Science and Systems - International
Ballroom
8:00 - 8:05 AM Bill Tynan W3XO: "Welcome & Introduction"
8:05 - 8:10 AM Al Brinkerhoff WB5PMR: "Symposium Opening Remarks & Orientation"
8:10 - 9:00 AM Prof. Robert Twiggs: "Investigating the Integrated Control of
Payloads: The Stanford SQUIRT MICRO-
Satellite Program"
9:00 - 9:30 AM Keith Pugh W5IU "Quiktrak for Windows"
by Bob McGwier N4HY
9:30 - 10:00 AM Tom Clark W3IWI: "Where Am I and What Time Is It?"
10:00 - 10:15 AM Break
10:15 - 10:45 AM Walter K. Daniel KE3HP: "Use of Star Cameras for
Attitude Determination of
Amateur Radio Satellites"
10:45 - 11:15 AM Doug Loughmiller KO5I "UoSAT: The Successful
Evolution..."
11:15 - 11:45 AM Greg Jones WD5IVD: "The TAPR/AMSAT DSP-93 Project"
with Bob Strickland N5BRG,
Robert Diersing N5AHD, and
Frank Perkins WB5IPM

11:45 - 1:00 PM Lunch Break

1:00 - 5:00 PM Session C - P3D Design Review - International Ballroom
1:00 - 1:05 PM Bill Tynan W3XO: "Phase 3D; A New Era for Amateur Satellites"
1:05 - 1:35 PM Dick Jansson WD4FABP3D "Mechanical and Thermal Design"
1:35 - 2:05 PM Dr. Karl Meinzer DJ4ZC: "P3D RF Subsystems and Attitude Control"
2:05 - 2:30 PM Stan Wood WA4NFY: "Antenna Designs of the P3D Spacecraft"
2:30 - 2:45 PM Lyle Johnson WA7GXD: "The P3D IHU and RUDAK-U"
2:45 - 3:00 PM Peter Guelzow DB2OS: "The P3D RUDAK-E"
3:00 - 3:15 PM Break
3:15 - 3:30 PM Dick Daniels W4PUJ: "The P3D Propulsion System"
3:30 - 4:10 PM Tom Clark W3IWI: "The P3D GPS Experiment"
4:10 - 4:20 PM WA1UVP & W3IWI: "The P3D GPS Hardware"
4:20 - 4:30 PM N3EUA,KD9KX,WA7GXD: "The P3D GPS Computer System"
4:30 - 4:40 PM W3IWI, WA5FXE: "The P3D GPS Antennas"
4:40 - 4:55 PM Doug Loughmiller G0SYX: "AMSAT-UK Contributions to P3D"

4:55 - 5:00 PM Steve Park WB9OEP: "Symposium Concluding Remarks"

6:00 - 7:00 PM Social Hour and Cash Bar - International Ballroom Lobby
7:00 - 11:00 PM Banquet and Annual Meeting - International Ballroom
Speaker: Dr. Paul Shuch N6TX, "The Search for Dark Matter"

Sunday, October 9, 1994
7:00 - 9:00 AM Area Coordinators Breakfast - Continental Room
9:00 - 2:00 PM Bus Tours to the P3D Integration Facility
10:00 AM Open Board of Directors Meeting - Continental Room
9:00 - 1:30 PM Session D - Satellite Operating - International Ballroom
9:00 - 9:30 AM Keith Baker KB1SF: "Beginners Forum"
9:30 - 10:00 AM Robert Diersing, N5AHD: "Examination of AO-16 and UO-22 Activity"
10:00 - 10:30 AM Dr. Paul Shuch N6TX: "Orbital Analysis by Sleight of Hand"
10:30 - 11:15 AM Ed Krome, KA9LNV: "Basics of Mode-S Operation & Feeds for Mode-S Dish Antennas"
11:15 - 11:45 AM Doug Varney WA1UVP: "MMICs at S-Band"
11:45 - 12:15 PM Gould Smith WA4SXM: "Beginners Guide to Radio Sputniks"
12:15 - 12:45 PM Ned Stearns AA7A: "A Major Field Day Satellite Operation"
12:45 - 1:00 PM Roy Welch W0SL: "AMSAT Software"
1:00 - 1:30 PM John Hansen WA0PTV: "Software for the Digital Birds"

Note: Eligibility for prizes and attendance at the Annual Meeting does not require purchase of a Banquet Ticket.

Registration and information about hotel rates and discounts can be obtained by calling AMSAT-NA Office Manager, Martha Saragovitz (NOCALL) by phone or writing to:
AMSAT
850 Sligo Ave., Suite 600
Silver Spring, MD 20910
Telephone: (301) 589-6062
FAX: (301) 608-3410

Don't delay in making your reservations and registering for what will be a great AMSAT Symposium!

/EX
SB SAT @ AMSAT $ANS-246.03
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 246.03 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 3, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-246.03

Weekly OSCAR Status Reports: 27-AUG-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12

Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only
Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
==========
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
==========
[G3RUH/DB2OS/VK5AGR]

AO-16: AO-16 is working well. [WH6I]

KO-23: KO-23 is working well. [WH6I]

KO-25: KO-25 seems again to be in one of its "deaf" modes. The BBS seems to be there but WH6I can't seem get it to respond at all and he never sees anyone in the link. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1359. Re: Jupiter photos

Newsgroup: rec.radio.amateur.space
Date: 1994-09-05 16:48:08 UTC
From: jimc1790@aol.com
Message-ID: <34fi48$ppv@search01.news.aol.com>
Source record: 26963

In article <9407241636.AA00994@gordon-tsd1.army.mil>,
carrl@gordon-tsd1.army.mil (Carr) writes:

The Space Telescope Institute in Baltimore has all the images available
via ftp.

Address is ftp.stsci.edu

1360. List of LEO Satellite companies needs completion

Newsgroup: rec.radio.amateur.space
Date: 1994-09-05 22:55:23 UTC
From: parsavan@boulder.Colorado.EDU
Message-ID: <34g7ks$md2@lace.Colorado.EDU>
Source record: 26964
Cross-posted to: sci.geo.satellite-nav,rec.radio.amateur.space,rec.radio.amateur.digital.misc

(I apologize in advance if readers feel that their newsgroup was not appropriate for this post. I picked the closest three I could find; feel free to email me if you think I should add or delete a newsgroup name from the newsgroup's line. (one companies name showed up in GPS world (hence sci.geo.satellite-nav)).

I would like to know the names and addresses (or phone numbers) of all companies that are planning low earth orbit communications systems. The following incomplete list has the ones I am familiar with so far, if anyone knows of any others please email me and I'll post an update later. Thank you.

Little LEO (data only) Project Name
---------------------- ------------
Orbital Communication Corp. ORBCOMM
Fairfax, Va.

Starsys Inc. Starnet
Lanham, Maryland

Big LEO (voice and data)

Motorola Inc. Irridium
Chandler, Arizona

TRW Inc. (This system is more medium earth orbit) Odyssey
Redondo Beach, California

Loral/Qualcomm Globalstar

dara parsavand who would be ecstatic to have a PET (Portable
parsavan@prony.colorado.edu Email Transciever), but is still waiting

1361. * SpaceNews 05-Sep-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-09-06 14:16:49 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0905.1994@ampr.org>
Source record: 26965
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0905
* SpaceNews 05-Sep-94 *

BID: $SPC0905

=========
SpaceNews
=========

MONDAY SEPTEMBER 5, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* SKY WATCH *
=============
In September's evening twilight, Saturn shines in the east-southeastern sky just above the horizon. By nightfall it is fairly high and bright, appearing as a golden point of light to the naked eye. Because Saturn is closest to Earth this year, it will attain a magnitude of 0.5, located in the constellation of Aquarius. Saturn may also be found by looking for the bright star of Formalhaut in the constellation of Piscis Austrinus which has a magnitude of +1.2. A small telescope will reveal the complex system of orbiting rings and moons. The largest moon, Titan, appears as an 8th magnitude point near the planet. Also Saturn's rings are now only 7 degrees from being edge on as seen from here on Earth.

Near the bright star, Spica, one can find Venus shining at a magnitude of -4.4 when the month begins. On the evening of September 8, Venus and the young Moon will pass each other in the western evening sky. On the evening of September 20, Venus wil reach it's greatest brilliancy at a magnitude of -4.6. If Venus is seen through a telescope, it will be found to be in a wanning crescent during it's brightest, showing us here on Earth, only half of it's brilliancy.

Jupiter is finally getting a rest after the tremendous impacts it suffered in July from the fragments of Comet Shoemaker-Levy 9. But Jupiter is still the second brightest planet after Venus, shining at a magnitude of -1.8 and can still be seen in the constellation of Libra. On September 1, Jupiter can be found about 15 degrees to the upper left of Venus and as the month passes, Jupiter will slide toward Venus in the western twilight sky. On September 9, Jupiter will be near the young crescent Moon. Watch for Venus, Jupiter, and the Moon on the evening of September 8 as the three approach each other. This will be a fine view for the astrophotographers who specialize in planet combinations.

Mercury can be found in the evening sky this month, but will remain very close to the horizon. Because Mercury will be so close to the horizon, it will probably be hidden from view this month.

Pluto can be found in the constellation of Libra and is in the southwestern sky just after sunset. But it shines at a magnitude of +13.8, so it will take a telescope of at least 8 inches to see the tiny point of light in the dark sky.

Uranus and Neptune, magnitudes 5.7 and 7.9, lie in the south after sunset during September in the rich starfields of Sagittarius.

Mars is the only planet that will rise a couple hours before dawn this month, in the eastern sky. On September 1 the wanning crescent Moon will be just below Mars.

[Info via Dave, N9JUW]

* WEBERSAT-OSCAR-18 NEWS *
==========
WEBER-1>CAST <UI>:
27-Aug-94

*Collecting and Sending WOD
Week2: All TLM Ch# 3C 3D 3E 3F 40 41
*New Images
*Monday, New Spectrum

73, IK3WVJ

WEBER>SPECT <UI>:
Spectrum #00 taken 20:55:36 28-Aug-94
arrays: +X:321340 +Y:0 -X:15400 -Y:0 +Z:2790 -Z:0 (uA)
sun angle: el 1 az 90
horizon sensors: 1:190 2:223 s:84
temp:-1.65 to -2.24 C
average = 202.03 stddev = 572.54 pkdev = 519.18
40000...417FF ....

* MIR NEWS *
============
The Mir space station apparently suffered no hits from the recent Perseid meteor shower. Several particles collided with the space station during last year's meteor shower.

The PROGRESS-M24 freighter was scheduled for launch Baykonur on 25-Aug-94 at 1425 UTC. Listeners in Western Europe were alerted listen for transmissions related to this launch on the known frequencies (166.140, 166.130, 165.874 and 922.755 MHz +/- Doppler) 3 hours after liftoff.

Instead of 4, only 2 EVAs will be made by Malenchenko and Musabayev. These EVAs are scheduled for the 8th and 12th of September 1994. Their purpose is to transfer solar panels from the Kristall to the Kvant-1 module.

The launch of Specktr (Module-O) has been delayed once again. Now there is word that the launch will take place in May 1995. Undoubtedly, this will also mean that the launch of Priroda (Module-E) will be put back too.

The schedule for American flights to Mir might need to be changed due to Spektr launch delay. No further details are available as of yet.

[Info via Chris v.d. Berg, NL-9165/A-UK3202]

* MORE MIR NEWS *
==========
Ascending nodes of Mir are currently taking place almost directly under the Sun. It is crossing the terminator close to its extreme northern and southern latitude excursions. As a result, Mir will be visible shortly before sunrise in the southern hemisphere, and shortly after sunset in the northern hemisphere for the next few weeks. Consult your favorite satellite orbital prediction software for the exact times for your location.

* SAREX NEWS *
==========
The STS-64 Space Shuttle Discovery Mission, tentatively scheduled for launch on September 9 at 20:30 UTC, will carry SAREX voice and packet radio on a 9 day mission. STS-64 will carry the Lidar In-Space Technology Experiment (LITE-1), the SPARTAN-201, and the Robot Operated Materials Processing System (ROMPS) experiment in addition to SAREX into a 57 degree inclination orbit.

Amateur Radio operators on Discovery include Dick Richards, KB5SIW, Commander, Blaine Hammond, KC5HBS, Pilot, and Jerry Linenger, KC5HBR, Mission Specialist. Primary callsign for FM voice contacts will be KB5SIW, while W5RRR-1 will be used for packet radio contacts. All operations will utilize separate uplink and downlink frequencies. DO NOT TRANSMIT on the downlink frequency!

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks: 144.91, 144.93, 144.95, 144.97, 144.99 MHz
(Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: the crew will not favor any specific uplink
frequency, so your ability to work the crew will
be the "luck of the draw"

Packet Freqs: Downlink: 145.55 MHz
Uplink: 144.49 MHz

The Goddard Amateur Radio Club station, WA3NAN, in Greenbelt Maryland will be active and carry SAREX Bulletins and Shuttle Retransmissions on 3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz and 147.450 MHz (FM).

The following Keplerian elements have been rotated to the current planned launch time of Sep 9 at 20:30 UTC. The JSC-005 epoch is at the start of orbit 5, after the trim burns on orbits 3 and 4. The negative drag fit was

required to match the design trajectory because there is a 6.5 fps trim burn
on orbit 28. The phasing and circ burns on orbit 99 lower the altitude by
about 8 n.mi, so the second element set JSC-006 is required after that.
These Keps are provided by Gil Carman, WA5NOM at the Johnson Space Center
ARC.

STS-64
1 00064U 94253.10077961 -.00030838 00000-0 -39665-4 0 59
2 00064 57.0058 195.1865 0009670 275.6619 84.3358 16.05979206 51

Note: This element set (JSC-005) is valid for orbits 2 through 98.
Use JSC-006 (below) after 15 Sep 94, 22:51:30 UTC (MET 6/03:49:30).

STS-64
1 00064U 94259.01448182 .00096406 00000-0 94275-4 0 62
2 00064 57.0059 167.2656 0009343 269.2157 90.7841 16.11240267 1002

Note: This element set (JSC-006) is valid for orbits 99 through 142.
Use JSC-005 (above) before 15 Sep 94, 22:51:30 UTC (MET 6/03:49:30).
The deorbit burn is scheduled for 18 Sep at 15:40 UTC (MET 8/20:38).

[Info via Frank Bauer, KA3HDO]

* THANKS! *
===========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

WB3CSY WB4MLE WB5PUM ZS5FR

...and Mike Conley, AA6AE, who posts SpaceNews in the science classroom
at Huntington Park High School in California, where they are building an
amateur satellite ground station.

* FEEDBACK/INPUT WELCOMED *
===========================
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1362. Radio Meteor Obs Bulletin Aug 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-09-06 18:45:36 UTC
From: steyaert@vvs.innet.be
Message-ID: <steyaert.17.0012C2BE@vvs.innet.be>
Source record: 26968

Radio Meteor Observation Bulletin No. 13 September 1994

1. FORWARD SCATTER METEOR OBSERVATIONS

Observer: M. De Meyere
Location: Deurle, Belgium (3 37' E, 51 00' N)
Frequency: 66.17 MHz
Transmitter Locations:
Katowice, PR3, Poland, 65.99 MHz, 14 kW, Distance 1100 km
P. Neant, PR3, Romania, 66.17 MHz, 40 kW, Distance 1400 km
Czestochowa, PR3, Poland, 66.23 MHz, 20 kW, Distance 1080 km
Gdansk, PR3, Poland, 66.29 MHz, 40 kW, Distance 1100 km

Antenna: crossed Yagi, 4 elements, Azimuth 270 o (=East), elevation 30 o
Antenna amplifier: 25 dB max level 90 dBmuV
Receiver: commercial, Progresson 447A, TESLA, Bratislava
Sensitivity: 8 muV for S/N = 26 dB (300 Ohm)
Observing method: automated setup, 150 samples/second, 8 bit resolution.
[Time and details of all individual meteor reflections are stored on file
in the University of Ghent format (Prometeos), and are available for
further analysis. Reduction software for DOS and Windows available].

Raw counts of reflections with a duration of at least 0.027 s
during one hour interval starting at UT:

August 1994
Perseids
Aug |
1994 | 20h 21 22 23 00 01 02 03 04 05 06

1- 2 | 58 70 63 67 16% 5% 75 129 121 71 76
2- 3 | 56 63 63 49 1% 5% 95 111 94 48 54
3- 4 | 46 45 62 51 7% 4% 57% 78 102 42 47
4- 5 | 52 48 53 72 17% 1% 54% 83 66 56 53
5- 6 | 63 66 51 55 13% 3% 37% 136 91 67 79
6- 7 | 37 72 81 65 71 14% 19% 68% 107 100 70
7- 8 | 53 55 57 60 7% 1% 105 133 80 93 100
8- 9 | 67 95 68 71 24% 0% 114 129 143 107 -
9-10 | 80 91 99 59 39% 5% 73 152 90 116 102
10-11 | 60 106 60 71 52% 2% 120 158 136 142 105
11-12 | 69 84 68 93 10% 5% 82% 167 165 198 186
12-13 | - 142 107 110 73% 11% 95% 239 214 199 207
13-14 | - 110 95 97 100 68% 11% 30% 179 162 111
14-15 | 62 88 72 73 7% 0% 31% 102 89 79 64
15-16 | 79 69 56 44 4% 1% 52% 126 111 76 64
16-17 | 54 64 48 49 30% 0% 34% 86 66 88 86

```
17-18 | 73 82 57 57 6% 0% 52% 111 104 85 75
18-19 | 67 69 78 56 2% 3% 75 85 140 87 51
19-20 | 51 63 49 67 6% 1% 54 58 140 87 51
20-21 | 44 58 59 67 54 13% 9% 21% 81 90 67
21-22 | 48 64 48 45 2% 0% 40% 83 70 72 70
22-23 | 43 66 44 89 3% 6% 44% 92 70 74 54
23-24 | - - - - - - - - - - -
24-25 | 64 74 74 55 4% 6% 82 99 112 72 -
25-26 | 47 78 62 45 4% 3% 54 90 97 93 88
26-27 | 55 66 44 49 6% 13% 59 74 88 83 100
27-28 | 68 89 67 77 59 2% 3% 64% 120 95 68
28-29 | 80 65 53 47 40 2% 52% 93 94 97 78
29-30 | 39 42 60 49 26% 1% 25% 91 103 73 -
30-31 | 56 56 55 49 32% 0% 59 77 81 83 81
31- 1 | 55 66 57 56 9% 1% 41% 92 80 81 71
------|-----------------------------------------------------
1994 | 20h 21 22 23 00 01 02 03 04 05 06
Aug

Aug |
1994 | 8h 9 10 11 12 13 14 15 16 17 18
-------------------------------------------------------------------
11 | 106 102 89 140 102 82 63 66 34 73 56
12 | 248 349 313 229 186 139 132 157 94 112 139
13 | 215 250 144 & & & & & 110 91
```

Notes:

. % : transmitter outage during the whole hour or a part of it. Low counts indicate that no other interference, which could be confused with meteors, is picked up.
Few transmitters are broadcasting between 2h-4h local time (Sat-Sun 3h-5h local time) or sometimes longer. (When summer hour is in use: local time = UT + 2h).

. & : manually eliminated for direct reception.

. The Perseids' new peak can be seen in the daytime data of Aug 12 between 8 h and 12h UT. Its intensity is lower than last year.
This period of high activity is confirmed by Paul Vauterin, based on the observations at the University of Ghent, as well as by several radio-amateurs:

"Maximum was on 12 August between 8h UT and 13 h UT.
Jacques ON4AVJ (Belgium)."

"Max activity during diurnal(?) peak, 12 Aug, around 11h00-11h30 UT.
Silvio IW1AZJ (Italy)."

"The 1st maximum seems to be at 12 Aug 09h-11h UT.
A second peak was around 12 Aug 22h UT to 13 Aug 04h UT.
Guido DL8EBW (Germany)."

"For me the best activity was around 11h00 UT 12 Aug 1994.
Jacob IC8FAX (Island of Capri)."

Peter Brown reported a visual outburst on August 12, lasting from 9h30 UT
to 11h00 UT (IAU Circular 6052 of Aug 12).
The classical Perseid maximum took place on Aug 13 at 3h UT.

M. De Meyere / C. Steyaert

2. PUBLICATION

" World Radio & Television Handbook", 1994 edition,
edited by Andrew G.Sennit, 599 pp., softbound.
1994 Billboard Books, ISBN 0-8230-5925-1, price approx 45 USD.
BPI Communications, 1515 Broadway, New York 10036, NY, USA.

This book contains country-by-country listings of long, medium and
shortwave transmitters by frequency, time and language. Addititionally it
provides the reader with information about:

. world satellite broadcasts;
. addresses of broadcasting organizations and DX Clubs;
. receiver test reports.

This book appears annually and is the major information source for
identifying FM stations contributing to forward scatter.

Jeroen Van Wassenhove

3. ABOUT THE RMOB

The RMOB is an independent initiative of some workers in the field of radio
meteor scatter observations and data reduction. It started in August 1993
in order to spread rapidly the Perseid results via E-mail. Since then, it
has appeared monthly, and has gradually been expanded.

Typically it contains: summaries of recent observations, first results of
stream activity by radio methods, relations between radio and optical meteors,
references to other publications in the field of meteor astronomy and radio
scatter techniques, announcements of meetings, short questions and answers,
non-commercial (second hand) sale of radio equipment, available software.

Contributors are mentioned, and interested persons are asked to contact them
directly.

RMOB can be copied freely in unabridged and unmodified form. Extracts should
indicate the source (Radio Meteor Obs Bulletin, month and year).

If you want to subscribe (or unsubscribe) to the E-mail distribution list,
please send a message to C. Steyaert.
Those not having access to E-mail can obtain a printed copy free of charge
from J. Van Wassenhove (current or backissues).

4. CONTRIBUTORS / USEFUL ADDRESSES

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E-mail: paul@izar.rug.ac.be

--
Christian Steyaert (RMOB9408) 6 September 1994
--

1363. Re: Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-09-06 19:59:32 UTC
From: paul@hooker.demon.co.uk
Message-ID: <778881572snz@hooker.demon.co.uk>
Source record: 26966

Hopefully a simple question ..

Could someone point me to some source code for converting the standard NASA
2 line element sets into orbital parameters giving :

inclination (I know, in the 2line data!)
period
apogee
perigee

There must be some information/source code somewhere on the net showing how,
but I haven't found it yet.

Thanks,

Paul
------------------------------< Who 'zat? >------------------------------
Paul Wilson paul@hooker.demon.co.uk

1364. ARLK038 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-09-06 22:39:26 UTC
From: w1aw@arrl.org
Message-ID: <$arlk038.1994@ampr.org>
Source record: 26967
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK038
ARLK038 Keplerian data

ZCZC SK06
QST de W1AW
Keplerian Bulletin 38 ARLK038
From ARRL Headquarters
Newington, CT September 7, 1994
To all radio amateurs

SB KEP ARL ARLK038
ARLK038 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-64
1 99964U 94253.10081708 .00050370 00000-0 49595-4 0 76
2 99964 57.0058 195.1863 0009249 269.4972 90.5059 16.05179220 56
AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
RS-10/11
1 18129U 87054A 94245.13494277 .00000018 00000-0 28619-5 0 9503
2 18129 82.9227 271.9677 0011527 163.1975 196.9559 13.72340699360467
UO-11
1 14781U 84021B 94242.05407815 .00000009 00000-0 94214-5 0 7247
2 14781 97.7858 253.3200 0012823 37.2927 322.9161 14.69239557561151
RS-12/13
1 21089U 91007A 94242.58574686 .00000049 00000-0 36517-4 0 7242
2 21089 82.9246 316.2773 0027677 261.9904 97.8111 13.74045626178867
AO-13
1 19216U 88051B 94244.06465693 -.00000319 00000-0 10000-4 0 9576
2 19216 57.7457 233.4755 7231019 349.2254 1.1276 2.09726877 16100
UO-14
1 20437U 90005B 94242.19112035 .00000012 00000-0 21614-4 0 254
2 20437 98.5882 325.9562 0011195 338.6747 21.3973 14.29853286240161
AO-16
1 20439U 90005D 94243.22354761 .00000004 00000-0 18510-4 0 8233
2 20439 98.5968 328.2876 0011378 336.3042 23.7623 14.29907282240320
```

```
DO-17
1 20440U 90005E 94242.19101324 -.00000002 00000-0 16333-4 0 8246
2 20440 98.5966 327.6156 0011538 338.5461 21.5240 14.30046939240192
WO-18
1 20441U 90005F 94243.21721374 .00000006 00000-0 19210-4 0 8266
2 20441 98.5975 328.6270 0012285 335.7331 24.3277 14.30021068240340
LO-19
1 20442U 90005G 94242.28078981 .00000002 00000-0 17882-4 0 8227
2 20442 98.5981 327.9775 0012453 337.8186 22.2455 14.30117960240227
FO-20
1 20480U 90013C 94242.36051676 .00000014 00000-0 99901-4 0 7201
2 20480 99.0483 20.2052 0540713 171.3929 189.6913 12.83227880213646
AO-21
1 21087U 91006A 94243.59191079 .00000093 00000-0 82657-4 0 5076
2 21087 82.9402 86.9165 0033651 233.2799 126.5239 13.74543749179948
UO-22
1 21575U 91050B 94241.73824273 .00000035 00000-0 26496-4 0 5277
2 21575 98.4306 314.7329 0008686 70.4243 289.7874 14.36929130163642
KO-23
1 22077U 92052B 94243.11394838 -.00000037 00000-0 10000-3 0 4221
2 22077 66.0839 123.1079 0015430 270.1307 89.7937 12.86286549 96423
KO-25
1 22830U 93061H 94242.21639135 -.00000008 00000-0 14107-4 0 3265
2 22830 98.5471 313.7710 0011188 324.2674 35.7752 14.28061512 48269
KO-25?
1 22828U 93061F 94242.63629114 .00000021 00000-0 26070-4 0 2988
2 22828 98.6425 317.7435 0010301 343.9905 16.0951 14.28064245 16405
IO-26
1 22826U 93061D 94243.20374381 .00000003 00000-0 19182-4 0 3205
2 22826 98.6495 318.2912 0009468 356.6267 3.4849 14.27737479 48394
AO-27
1 22825U 93061C 94241.75642219 .00000007 00000-0 20508-4 0 3208
2 22825 98.6479 316.8078 0009042 359.3250 0.7917 14.27632689 48182
PO-28
1 22829U 93061G 94243.20371906 .00000005 00000-0 19698-4 0 3134
2 22829 98.6454 318.3232 0010119 342.4454 17.6372 14.28038204 48405
Mir
1 16609U 86017A 94245.23608396 .00003349 00000-0 52437-4 0 7357
2 16609 51.6468 160.9012 0001260 9.1290 350.9726 15.56885593488022

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Saturday,
September 10, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1365. Beginners list

Newsgroup: rec.radio.amateur.space
Date: 1994-09-07 02:23:11 UTC
From: Andrew Naylor <anaylor@delphi.com>
Message-ID: <ZU+zmfv.anaylor@delphi.com>
Source record: 26969

I was wondering if there is a list of all the operating, amateur radio satellites along with a short description about modes, freqs. etc. I have made a few contacts on Mir, RS10/11, and RS12/13 but that's about it. Thanks in advance. N0UJT

1366. listen in on space shuttle in Michigan?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-07 04:02:33 UTC
From: ncschult@vela.acs.oakland.edu
Message-ID: <ncschult.778910553@vela.acs.oakland.edu>
Source record: 26970
Cross-posted to: rec.radio.scanner,rec.radio.amateur.space

I have a very long list of freqs.Iwant to know if I can listen in while the shuttle is up next week?I have a pro 43.

Thanks in advance,NCS

1367. Oscar-21...

Newsgroup: rec.radio.amateur.space
Date: 1994-09-07 16:42:07 UTC
From: donw@marconi.w8upd.uakron.EDU
Message-ID: <9409071642.AA10766@marconi.w8upd.uakron.edu>
Source record: 26971

How can I get Oscar-21...Rudak2...info by ftp or other means...?
I guess I need the keplerian data to update my satellite tracking program.
Thanks for reading and replying...Don...kb8pyi
Internet: donw@marconi.w8upd.uakron.edu
Packet: kb8pyi@wb8bii.#neoh.oh.usa.na

1368. Re: listen in on space shuttle in Michigan?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-07 20:07:23 UTC
From: weinkar@aa.wl.com
Message-ID: <1994Sep7.150723.1@aa.wl.com>
Source record: 26972
Cross-posted to: rec.radio.scanner,rec.radio.amateur.space

In article <ncschult.778910553@vela.acs.oakland.edu>, ncschult@vela.acs.oakland.edu (N C Schultheiss) writes:
> I have a very long list of freqs.Iwant to know if I can listen in while
> the shuttle is up next week?I have a pro 43.
>
> Thanks in advance,NCS
--

Until recently, NASA Select Audio was retransmitted on
the WD8OXB Repeater, 145.410, in Commerce Township.
Lately, though, I have noticed a distant Canadian ID
on that frequency, and WD8OXB's machine appears to be
down.

Rich Weinkauf

"Waiter, would you serve the nuts...
I mean, serve the guests the nuts?"
--Nora Charles, "The Thin Man"

1369. Solar System CD-ROM

Newsgroup: rec.radio.amateur.space
Date: 1994-09-07 20:14:08 UTC
From: paulpha@aol.com
Message-ID: <34l6ug$ddc@search01.news.aol.com>
Source record: 26973

Voyage Through The Solar System"

A full- motion Journey through the heavens.

Age: 8 to Adult/ General Reference

Voyage Through The Solar System" is already winning accolades from across the country. The director of the Texas Space Camp rates this CD-ROM as the best new space title. The wonders of our solar system are presented in extraordinary detail with over 70 JPL/NASA movies, full narration and original music and slide shows.

This easy to use disk also has generous amounts of text , data and astronomical expert accounts providing hours of interactive entertainment and learning. Just point and click. The program operates on either PC Windows or Mac.....all on the same disc.

Each planet in our solar system is detailed with actual JPL/NASA probe photographs and one of the largest collection of full -motion videos and animation's ever compiled on one CD. You'll also find detailed information on each planet's moons, scientific discoveries, comets and the asteroid belt all in an easy and fun to use interface.

System requirements:

PC Windows, 386 or higher, minimum of 4 mb of RAM, 640x480 256 color VGA graphics card and monitor, MPC-compatable sound card. Double speed drive recommended
Macintosh: LC11 or higher with 8 bit or higher color display, 5 MB of RAM. Double speed drive recomended.

Price: $49.95 (we pay all air shipping and handling charges)
send check or money order to:

Palo/Haklar & Associates
650 N Bronson Street #144
Hollywood, Ca 90004
USA
fax 213-465-2686

1370. Re: listen in on space shuttle in Michigan?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-07 23:56:13 UTC
From: hrsblackwell@hrs.gsfc.nasa.gov
Message-ID: <hrsblackwell-0709941956130001@n3kwu.gsfc.nasa.gov>
Source record: 26974
Cross-posted to: rec.radio.scanner,rec.radio.amateur.space

In article <ncschult.778910553@vela.acs.oakland.edu>,
ncschult@vela.acs.oakland.edu (N C Schultheiss) wrote:

> I have a very long list of freqs.Iwant to know if I can listen in while
> the shuttle is up next week?I have a pro 43.
>
> Thanks in advance,NCS

Don't know about local stuff but if you have an HF reciever we will be on

3,860 and 7,185 KHz
14,295 and 21,395 KHz

during the mission of STS-64

Jim Blackwell, N3KWU
President, Goddard Amateur Radio Club

1371. STS-64 MacSPOC Checkpoint #0

Newsgroup: rec.radio.amateur.space
Date: 1994-09-08 02:38:39 UTC
From: tstader@si.tiac.net
Message-ID: <tstader-0709942238390001@si.tiac.net>
Source record: 26975

MacSPOC Users-

The enclosed checkpoint will become valid at 0/04:48 MET following an ontime, nominal STS-64 launch Friday, September 9 at 3:30 PM CDT. The checkpoint reflects prelaunch planning for 2 small trim burns executed shortly beforehand and should be approximately correct following the OMS-2 burn at 0/00:38 MET.

The prime end-of-mission deorbit opportunity is to KSC on Orbit 158 at 9/19:06 MET, with landing on Orbit 159 at 9/20:01 MET, or 11:31 AM CDT, Monday, September 19. Discovery's primary STS-64 payload is the LIDAR In Space Technology Experiment (LITE). Operating at both visible and invisible wavelengths, LITE will beam laser energy earthward from Discovery to detect scattered or reflected signals from the ground, clouds, and atmospheric particles using a 1-meter telescope in the payload bay. The success of LITE will have important implications for the atmospheric sciences, particularly meteorology.

Although visible laser pulses could damage the eye if viewed through telescopes with apertures larger than 6 inches, this hazard is considered remote. It is only present under clear skies for an observer located within the laser's beam width. On the ground, this beam width is about 1000 feet in diameter, with successive pulses spaced about every 2400 feet. As a precaution for the astronomical community, NASA will be posting detailed STS-64 trajectory information to the sci.space.shuttle Internet news group.

At approximately 3/23:15 MET, Discovery's crew will release the Shuttle Pointed Autonomous Research Tool for Astronomy 201 (SPARTAN 201) satellite from the Remote Manipulator System (RMS). The sun's corona will be studied by SPARTAN 201's instruments at ranges up to about 100 nm from Discovery until it's retrieved around 5/22:30 MET.

From 6/16:30 to 6/22:30 MET, an EVA is planned to evaluate the Simplified Aid For EVA Rescue (SAFER) backpack. With SAFER's propulsion and control capabilities, it will be possible for EVA crewmembers to perform small untethered maneuvers in Discovery's payload bay.

Among the many STS-64 secondary payloads is the Shuttle Amateur Radio Experiment (SAREX). Contacts with schools and amateur radio operators worldwide are to be made using licensed crewmembers or a "robot" mode in which earthbound calls are automatically acknowledged, then logged aboard Discovery.

MacSPOC v1.5 users will want to make note of a TDRSS configuration change tentatively planned from about 7/01:45 (Orbit 114) to 8/03:05 (Orbit 131)

MET. Since MacSPOC v1.5 was published early last year, nearly all Shuttle operations have been supported by TDRSS elements stationed at 174 W and 41 W longitude. During this period, however, support will come from elements at 171 W and 46 W. This will lengthen the Zone Of Exclusion (ZOE) loss of contact with Discovery by a couple minutes. To follow the current TDRSS configuration during STS-64, be prepared to select "GeoSat Status..." from MacSPOC's "Update" menu. Refined TDRSS support schedules will be uploaded if they become available for release during the mission.

-Dan Adamo
adamod@aol.com

========cut here===========
Orbit 4 Predicted Post-Trim-2 Burn
1994 252 (9- 9) 20 30 .000
1994 253 (9-10) 1 17 53.646
0.244960555478D+07 0.145346639919D+00
1 4
0.323218300000D+07 -0.114394810000D+08 0.182439360000D+08
0.245461180000D+05 0.657777500000D+04 -0.224000000000D+03
2750.0 229966.0 79.00 2.72

1372. STS-64 Earth Obs Database

Newsgroup: rec.radio.amateur.space
Date: 1994-09-08 02:39:56 UTC
From: tstader@si.tiac.net
Message-ID: <tstader-0709942239560001@si.tiac.net>
Source record: 26976

MacSPOC Users-

The enclosed earth observations site database will be used by STS-64's crew during their upcoming mission. To access the database by default whenever MacSPOC loads, store it in the same folder as the MacSPOC application using the name "Earth Obs".

-Dan Adamo
adamod@aol.com

========cut here===========
C040 Edmonton, Canada 53.5 -113.5 12
C048 St. Johns, Newfoundland 47.5 -52.8 80
T052 Scottish Highlands 57.0 -4.5 12
T059 Alps 46.5 10.5 12
T060 Rhine Graben/German Deforestation 49.3 10.0 12
T066 Dinaric Alps 44.5 17.0 12
T213 Australian Alps -36.0 148.5 6
T215 Tasmania -42.0 146.5 6
T216 North Island -38.0 175.5 6
T252 Coastal/Cascade Range 44.5 -122.5 12
T268 Nebraska Sand Hills 42.0 -102.0 12
T274 Chicago - Milwaukee Area 42.5 -88.0 12
T284 Newfound./Nova Scotia Fault Zone 47.0 -61.5 80
T422 Iberian Peninsula 39.0 -4.5 18
T575 Lake Winnipeg/Manitoba 52.0 -99.0 12
W018 Black Sea, Bosporus 43.0 33.0 6
W020 Sea Of Azov 46.0 37.0 12
W021 Caspian Sea 42.0 50.0 6
X004 Great Wall of China 38.0 107.8 30
X023 Melbourne -37.9 145.0 6
X028 London, England 51.3 -0.1 12
X029 Dublin, Ireland 53.2 -6.2 12
X030 Edinburgh, Scotland 55.6 -3.1 12
X031 Glasgow, Scotland 55.5 -4.2 12
X032 Salisbury, England 51.1 -1.5 12
X033 Paris, France 48.5 2.2 12
X034 Madrid, Spain 40.2 -3.4 18
X035 Rome, Italy 41.5 12.3 12
X036 Athens, Greece 37.6 23.4 12
X037 Oslo, Norway 59.6 10.5 12
X038 Cairo, Egypt 30.0 31.2 12
X039 Vienna, Austria 48.1 16.2 12
X040 Southwest Wisconsin 43.5 -90.0 12
X041 Cold Lake AFB, Alberta 54.3 -110.2 12

```
X042 Guadalcanal -9.7 160.3 6
X043 Angola/Namibia Border -17.6 19.0 18
X044 Fraser Island -25.2 153.2 6
X045 Chernobyl 51.3 30.3 12
X046 Regina, Saskatchewan 50.4 -104.4 12
X047 Boise, Idaho 43.7 -116.2 12
X048 Helena, Montana 46.7 -112.0 12
X049 Bismarck, North Dakota 46.8 -100.8 12
X050 Pierre, South Dakota 44.4 -100.3 12
X051 Lincoln, Nebraska 40.8 -96.7 12
X052 Minneapolis/St. Paul, Minnesota 45.0 -93.3 12
X053 Rarotonga -21.3 -159.8 6
```

1373. STS-64 ATL

Newsgroup: rec.radio.amateur.space
Date: 1994-09-08 02:41:08 UTC
From: tstader@si.tiac.net
Message-ID: <tstader-0709942241080001@si.tiac.net>
Source record: 26977

MacSPOC Users-

The enclosed attitude time line (ATL) reflects STS-64 prelaunch planning
and is only accessed by MacSPOC v1.5. To access the ATL by default
whenever v1.5 loads, store it in the same folder as the MacSPOC
application using the name "ATL".

-Dan Adamo
adamod@aol.com

========cut here===========
000/00:30:00.000 OMS - 2 INTL 332.000 120.000 24.000
000/01:12:00.000 Post Insertion LVLH 0.000 180.000 270.000
000/03:46:00.000 +X RCS Orb Trim INTL 236.000 182.000 326.000
000/04:10:00.000 LVLH Hold LVLH 89.860 16.280 15.080
000/04:28:00.000 +X RCS Orb Circ INTL 302.000 9.000 3.000
000/04:55:00.000 IMU Align INTL 305.000 13.000 11.000
000/05:10:00.000 LITE Checkout LVLH 90.000 90.000 85.000
000/16:45:00.000 IMU Align INTL 290.000 54.000 29.000
000/17:05:00.000 LITE Run A LVLH 185.000 0.000 0.000
000/22:00:00.000 H2O Dump LVLH 0.000 180.000 90.000
001/04:35:00.000 LITE Run B LVLH 355.000 180.000 0.000
001/14:50:00.000 LITE Run C/D LVLH 90.000 90.000 85.000
002/19:11:00.000 LMT Setup LVLH 0.000 215.000 90.000
002/19:16:00.000 Sweep Setup LVLH 185.000 0.000 0.000
002/19:55:00.000 Sweep Mnvr 1 LVLH 210.000 0.000 0.000
002/19:55:13.000 Sweep Mnvr 2 LVLH 150.000 0.000 0.000
002/19:55:43.000 Sweep Mnvr 3 LVLH 210.000 0.000 0.000
002/19:56:13.000 Sweep Mnvr 4 LVLH 185.000 0.000 0.000
002/21:25:00.000 Sweep Mnvr 1 LVLH 210.000 0.000 0.000
002/21:25:13.000 Sweep Mnvr 2 LVLH 150.000 0.000 0.000
002/21:25:43.000 Sweep Mnvr 3 LVLH 210.000 0.000 0.000
002/21:26:13.000 Sweep Mnvr 4 LVLH 185.000 0.000 0.000
003/02:55:00.000 IMU -Z COAS INTL 113.000 312.000 319.000
003/03:35:00.000 LITE Run E LVLH 5.000 180.000 0.000
003/13:20:00.000 AMOS PRCS-ZERO LVLH 34.500 180.000 0.000
003/13:51:00.000 H2O Dump LVLH 0.000 180.000 90.000
003/22:24:00.000 SPARTAN Deploy INTL 318.800 209.900 43.190
003/23:50:00.000 SEP 3 +X RCS INTL 124.000 11.000 22.000
004/00:10:00.000 LITE Run F LVLH 175.000 0.000 0.000
004/14:59:00.000 IMU Align INTL 305.000 13.000 11.000
004/15:15:00.000 LITE Run G LVLH 90.000 90.000 85.000
004/20:30:00.000 LMT Setup LVLH 0.000 215.000 90.000
004/20:35:00.000 LITE Run G LVLH 90.000 90.000 85.000
004/21:50:00.000 LMT Setup LVLH 0.000 215.000 90.000

004/21:55:00.000 LITE Run G LVLH 90.000 90.000 85.000
004/23:20:00.000 LMT Setup LVLH 0.000 215.000 90.000
004/23:25:00.000 LITE Run G LVLH 90.000 90.000 85.000
004/23:38:00.000 LMT Setup LVLH 0.000 215.000 90.000
004/23:43:35.000 LITE Run G/H LVLH 90.000 90.000 85.000
005/13:24:00.000 IMU Align INTL 305.000 13.000 11.000
005/13:45:00.000 -ZLV Nose South LVLH 0.000 180.000 90.000
005/17:07:00.000 +X RCS NC4 INTL 278.000 93.000 19.000
005/17:31:00.000 -Y Target Track LVLH 90.000 280.000 0.000
005/19:33:00.000 RADAR Target Track LVLH 325.000 270.000 0.000
005/20:32:00.000 Post Ti -Z Trk LVLH 0.000 270.000 0.000
005/21:05:00.000 -Z Target Track LVLH 0.000 300.000 0.000
005/21:08:00.000 Inertial Approach INTL 146.000 209.000 353.000
005/22:35:00.000 Post Grapple LVLH 0.000 180.000 0.000
006/00:10:00.000 OMS HITE INTL 210.000 347.000 340.000
006/00:32:00.000 LVLH Hold LVLH 0.770 197.460 359.680
006/01:00:00.000 OMS CIRC INTL 151.000 167.000 20.000
006/01:20:00.000 H2O Dump LVLH 0.000 180.000 90.000
006/03:15:00.000 LITE Run I LVLH 185.000 0.000 0.000
006/13:17:00.000 IMU Align INTL 104.000 305.000 334.000
006/13:37:00.000 SAFER -ZLV LVLH 0.000 180.000 270.000
006/18:30:00.000 Prec Flt Setup LVLH 307.450 52.550 324.070
006/18:40:00.000 Inertial Hold INTL 82.410 218.500 34.990
006/19:00:00.000 SAFER -ZLV LVLH 0.000 180.000 270.000
006/20:25:00.000 Prec Flt Setup LVLH 307.450 52.550 324.070
006/20:35:00.000 Inertial Hold INTL 128.160 294.960 359.400
006/20:55:00.000 SAFER -ZLV LVLH 0.000 180.000 270.000
007/02:00:00.000 LITE Run J LVLH 270.000 270.000 85.000
007/13:15:00.000 LITE Run X LVLH 270.000 90.000 275.000
007/20:35:00.000 SOPA-H2O-ROMPS LVLH 0.000 180.000 85.000
008/14:30:00.000 FCS Checkout LVLH 275.000 90.000 0.000
008/18:05:00.000 H2O Dump LVLH 0.000 180.000 85.000
009/00:40:00.000 IMU Align INTL 308.000 35.000 355.000
009/01:00:00.000 HUD Cal INTL 308.000 33.000 341.000
009/01:24:00.000 -ZLV ROMPS LVLH 0.000 180.000 90.000
009/12:43:00.000 IMU Align INTL 308.000 35.000 355.000
009/13:05:00.000 -ZLV Nose South LVLH 0.000 180.000 90.000
009/14:50:00.000 Rad Coldsoak INTL 126.620 4.120 352.810
009/16:08:00.000 D-O IMU Align INTL 185.000 205.000 346.000
009/16:24:00.000 D-O IMU Verif INTL 54.000 134.000 14.000
009/16:30:00.000 D-O Thermal INTL 88.000 332.000 357.000
009/18:51:00.000 D-O Burn KSC INTL 207.000 350.000 324.000
009/19:10:00.000 MM 303 INTL 136.000 215.000 4.000
009/19:31:00.000 MM 304 LVLH 0.000 40.000 0.000

1374. DSS Mail Order Outlets

Newsgroup: rec.radio.amateur.space
Date: 1994-09-08 13:31:27 UTC
From: sraike@slacc.com
Message-ID: <1055DKNVPLCLEVSEYF@slacc.com>
Source record: 26978

Does anyone know of a mail order outlet with RCA DSS systems in stock?
I live in St. Louis and the systems might not be available until the
first of the year. I'm anxious. Thanks,

Stu
sraike@slacc.com

--
SLACC STACK BBS - St. Louis, Missouri USA
The Bulletin Board Service of the St. Louis Area Computer Club
For information, email to: server@slacc.com Subject: HELP
+1 314.367.1903

1375. PB Setup..help

Newsgroup: rec.radio.amateur.space
Date: 1994-09-08 21:21:09 UTC
From: tsmithers@cix.compulink.co.uk
Message-ID: <Cvtxz9.Iww@cix.compulink.co.uk>
Source record: 26979

I have been trying to set up PB for reception of Oscar 16, so far without
much success.
The modem is a PSK-1T set with Parity 0,Awlen 8, Kiss on. The PSK is set
to Man,USB, PSK on, 9600bd...PC is also set to 9600.
Using Procomm+ this arrangement seems to work in that I can receive some
of the data from O16, and shows that signals are getting from the modem
to the pc. However I cannot get any response from PB.
PB.cfg is as follows,

```
mycall G0KTN
bdcstcall PACSAT-11
port 2
speed 9600
restart_delay 60
txd 150
graball 1
kisstnc 1
```

Can anyone see what I've missed..advice would be appreciated.

73 Trevor G0KTN
tsmithers@cix.compulink.co.uk

1376. SETIQuest Magazine - Exobiology

Newsgroup: rec.radio.amateur.space
Date: 1994-09-08 23:08:02 UTC
From: klaes@mtwain.enet.dec.com
Message-ID: <34o20s$4ag@nntpd.lkg.dec.com>
Source record: 26980
Cross-posted to: rec.radio.amateur.policy,rec.radio.amateur.space

SETIQuest is a new quarterly print/electronic mail (E-mail) periodical containing news, technical information, and tutorials devoted to bioastronomy and its subset, SETI (Search for Extraterrestrial Intelligence).

SETIQuest is published for professionals, serious amateur astronomers, and individuals curious about this fascinating field of observation. SETIQuest fills the need for a specialized astronomical publication devoted exclusively to the on-going search for evidence of life in the Universe. Such evidence could be intentional or inadvertent signals of other civilizations. Such evidence could be found in spectral signatures of biological activity on extrasolar planets or in the interstellar medium.

SETIQuest is written and edited for the scientifically literate individual taking part in the progress of our technological civilization, with articles by amateur and professional scientists. SETIQuest includes information about hands-on observational programs that can be carried out by individuals and groups of amateur astronomers at radio and optical wavelengths.

SETIQuest is filled with articles covering topics such as:

* Tutorials about bioastronomy and SETI
* Microwave or optical SETI as practiced by amateurs
* "Do-it-yourself" participation in bioastronomy and SETI activities
* Book reviews
* Regular commentary on issues relevant to SETI and bioastronomy:

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Philosophical issues regarding the prospects of success and failure in the search

SETI as a parable of science versus pseudo science

Publications Watch: Summaries of recent scientific/general publications relevant to SETI

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---------------------------------=|=-------------------------------------
Carl Helmers, President & Editorial Director, Helmers Publishing, Inc.
--< Publishers of Sensors, ID Systems and SETIQuest magazines >--
(what else do you do after starting BYTE?)
INTERNET: carl@pixelacres.mv.com
SNAILMAIL: 174 Concord Street, Peterborough, NH 03458
PHONE: 603-924-9631 -=- FAX: 603-924-7408

1377. orbs$252.1of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-09 14:06:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-252.o.1994@ampr.org>
Source record: 26981
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-252.O
Orbital Elements 252.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX September 9, 1994
BID: $ORBS-252.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94215.22805310
Element set: 295
Inclination: 27.0009 deg
RA of node: 314.8290 deg
Eccentricity: 0.6026240
Arg of perigee: 199.5326 deg
Mean anomaly: 120.6764 deg
Mean motion: 2.05881876 rev/day
Decay rate: -3.02e-06 rev/day^2
Epoch rev: 8375
Checksum: 286

Satellite: UO-11
Catalog number: 14781
Epoch time: 94246.07218413
Element set: 725
Inclination: 97.7857 deg
RA of node: 257.1497 deg
Eccentricity: 0.0012609
Arg of perigee: 25.2874 deg
Mean anomaly: 334.8945 deg
Mean motion: 14.69240533 rev/day
Decay rate: 5.7e-07 rev/day^2
Epoch rev: 56174
Checksum: 331

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94249.07204211
Element set: 954
Inclination: 82.9209 deg
RA of node: 269.0556 deg
Eccentricity: 0.0012014
Arg of perigee: 152.4193 deg
```

Mean anomaly: 207.7602 deg
Mean motion: 13.72340827 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 36100
Checksum: 276

Satellite: AO-13
Catalog number: 19216
Epoch time: 94250.73996645
Element set: 961
Inclination: 57.7429 deg
RA of node: 232.3061 deg
Eccentricity: 0.7230985
Arg of perigee: 349.7633 deg
Mean anomaly: 0.9499 deg
Mean motion: 2.09718556 rev/day
Decay rate: 2.71e-06 rev/day^2
Epoch rev: 4774
Checksum: 344

Satellite: FO-20
Catalog number: 20480
Epoch time: 94247.42862192
Element set: 722
Inclination: 99.0488 deg
RA of node: 24.3224 deg
Eccentricity: 0.0541357
Arg of perigee: 159.9373 deg
Mean anomaly: 202.3927 deg
Mean motion: 12.83228220 rev/day
Decay rate: 4.2e-07 rev/day^2
Epoch rev: 21429
Checksum: 294

Satellite: AO-21
Catalog number: 21087
Epoch time: 94251.01676119
Element set: 510
Inclination: 82.9364 deg
RA of node: 81.4154 deg
Eccentricity: 0.0033935
Arg of perigee: 211.9250 deg
Mean anomaly: 147.9850 deg
Mean motion: 13.74544212 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 18096
Checksum: 292

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94246.59078278

Element set: 725
Inclination: 82.9245 deg
RA of node: 313.3082 deg
Eccentricity: 0.0027684
Arg of perigee: 249.8946 deg
Mean anomaly: 109.9234 deg
Mean motion: 13.74045561 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 17941
Checksum: 339

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94243.05287604
Element set: 275
Inclination: 2.0332 deg
RA of node: 96.0279 deg
Eccentricity: 0.2914017
Arg of perigee: 190.0489 deg
Mean anomaly: 163.3275 deg
Mean motion: 1.42202991 rev/day
Decay rate: -1.07e-06 rev/day^2
Epoch rev: 226
Checksum: 270

/EX
SB KEPS @ AMSAT $ORBS-252.D
Orbital Elements 252.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX September 9, 1994
BID: $ORBS-252.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94246.24979174
Element set: 26
Inclination: 98.5880 deg
RA of node: 329.9585 deg
Eccentricity: 0.0010966
Arg of perigee: 326.7938 deg
Mean anomaly: 33.2550 deg
Mean motion: 14.29853612 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 24074
Checksum: 325

Satellite: AO-16
Catalog number: 20439
Epoch time: 94243.22354761
Element set: 823

Inclination: 98.5968 deg
RA of node: 328.2876 deg
Eccentricity: 0.0011378
Arg of perigee: 336.3042 deg
Mean anomaly: 23.7623 deg
Mean motion: 14.29907282 rev/day
Decay rate: 4.0e-08 rev/day^2
Epoch rev: 24032
Checksum: 306

Satellite: DO-17
Catalog number: 20440
Epoch time: 94246.24913465
Element set: 825
Inclination: 98.5966 deg
RA of node: 331.6231 deg
Eccentricity: 0.0011315
Arg of perigee: 326.6136 deg
Mean anomaly: 33.4328 deg
Mean motion: 14.30047248 rev/day
Decay rate: -3.0e-08 rev/day^2
Epoch rev: 24077
Checksum: 284

Satellite: WO-18
Catalog number: 20441
Epoch time: 94243.21721374
Element set: 826
Inclination: 98.5975 deg
RA of node: 328.6270 deg
Eccentricity: 0.0012285
Arg of perigee: 335.7331 deg
Mean anomaly: 24.3277 deg
Mean motion: 14.30021068 rev/day
Decay rate: 6.0e-08 rev/day^2
Epoch rev: 24034
Checksum: 280

Satellite: LO-19
Catalog number: 20442
Epoch time: 94246.75849338
Element set: 823
Inclination: 98.5978 deg
RA of node: 332.4001 deg
Eccentricity: 0.0012219
Arg of perigee: 324.7459 deg
Mean anomaly: 35.2913 deg
Mean motion: 14.30118615 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 24086
Checksum: 303

Satellite: UO-22
Catalog number: 21575
Epoch time: 94246.12512292
Element set: 528
Inclination: 98.4302 deg
RA of node: 319.0283 deg
Eccentricity: 0.0008689
Arg of perigee: 59.0874 deg
Mean anomaly: 301.1166 deg
Mean motion: 14.36929252 rev/day
Decay rate: -3.0e-08 rev/day^2
Epoch rev: 16427
Checksum: 301

Satellite: KO-23
Catalog number: 22077
Epoch time: 94243.11394838
Element set: 422
Inclination: 66.0839 deg
RA of node: 123.1079 deg
Eccentricity: 0.0015430
Arg of perigee: 270.1307 deg
Mean anomaly: 89.7937 deg
Mean motion: 12.86286549 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9642
Checksum: 315

Satellite: AO-27
Catalog number: 22825
Epoch time: 94246.24191330
Element set: 321
Inclination: 98.6482 deg
RA of node: 321.2471 deg
Eccentricity: 0.0008932
Arg of perigee: 346.8547 deg
Mean anomaly: 13.2395 deg
Mean motion: 14.27633083 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 4882
Checksum: 296

Satellite: IO-26
Catalog number: 22826
Epoch time: 94243.20374381
Element set: 320
Inclination: 98.6495 deg
RA of node: 318.2912 deg
Eccentricity: 0.0009468
Arg of perigee: 356.6267 deg
Mean anomaly: 3.4849 deg
Mean motion: 14.27737479 rev/day

Decay rate: 3.0e-08 rev/day^2
Epoch rev: 4839
Checksum: 330

Satellite: KO-25
Catalog number: 22830
Epoch time: 94246.70054461
Element set: 327
Inclination: 98.5472 deg
RA of node: 318.1598 deg
Eccentricity: 0.0011121
Arg of perigee: 310.7839 deg
Mean anomaly: 49.2365 deg
Mean motion: 14.28061576 rev/day
Decay rate: -2.9e-07 rev/day^2
Epoch rev: 4890
Checksum: 306

Satellite: 22828
Catalog number: 22828
Epoch time: 94246.70003989
Element set: 299
Inclination: 98.6425 deg
RA of node: 321.7648 deg
Eccentricity: 0.0010289
Arg of perigee: 331.7229 deg
Mean anomaly: 28.3378 deg
Mean motion: 14.28064524 rev/day
Decay rate: 4.0e-08 rev/day^2
Epoch rev: 1698
Checksum: 343

/EX

1378. orbs$.252.2of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-09 14:10:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-252.w.1994@ampr.org>
Source record: 26982
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-252.W
Orbital Elements 252.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX September 9, 1994
BID: $ORBS-252.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94250.77061508
Element set: 945
Inclination: 99.0435 deg
RA of node: 302.1944 deg
Eccentricity: 0.0015171
Arg of perigee: 350.3917 deg
Mean anomaly: 9.6960 deg
Mean motion: 14.13639907 rev/day
Decay rate: 5.6e-07 rev/day^2
Epoch rev: 50192
Checksum: 308

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94250.73664265
Element set: 842
Inclination: 98.5110 deg
RA of node: 257.2257 deg
Eccentricity: 0.0014132
Arg of perigee: 87.2811 deg
Mean anomaly: 272.9991 deg
Mean motion: 14.24903883 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 41425
Checksum: 313

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94250.39554426
Element set: 391
Inclination: 82.5412 deg
RA of node: 203.1859 deg
Eccentricity: 0.0015983
Arg of perigee: 315.5211 deg
```

Mean anomaly: 44.4664 deg
Mean motion: 13.84720625 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 33373
Checksum: 299

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94246.49018649
Element set: 320
Inclination: 82.5381 deg
RA of node: 268.2735 deg
Eccentricity: 0.0018539
Arg of perigee: 67.2957 deg
Mean anomaly: 293.0126 deg
Mean motion: 13.16968553 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29356
Checksum: 332

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94250.70637069
Element set: 762
Inclination: 99.1810 deg
RA of node: 241.6693 deg
Eccentricity: 0.0011090
Arg of perigee: 264.3496 deg
Mean anomaly: 95.6404 deg
Mean motion: 14.13014274 rev/day
Decay rate: 6.0e-07 rev/day^2
Epoch rev: 30679
Checksum: 295

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94246.56910060
Element set: 321
Inclination: 82.5172 deg
RA of node: 81.4335 deg
Eccentricity: 0.0015197
Arg of perigee: 11.7751 deg
Mean anomaly: 348.3746 deg
Mean motion: 13.84371453 rev/day
Decay rate: 2.0e-07 rev/day^2
Epoch rev: 27853
Checksum: 299

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94247.84879149

Element set: 137
Inclination: 82.5512 deg
RA of node: 214.8917 deg
Eccentricity: 0.0007981
Arg of perigee: 92.6591 deg
Mean anomaly: 267.5439 deg
Mean motion: 13.04426670 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23328
Checksum: 321

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94246.22753404
Element set: 824
Inclination: 82.5492 deg
RA of node: 146.4951 deg
Eccentricity: 0.0014715
Arg of perigee: 292.4370 deg
Mean anomaly: 67.5233 deg
Mean motion: 13.84182449 rev/day
Decay rate: -8.4e-07 rev/day^2
Epoch rev: 21141
Checksum: 301

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94251.22505974
Element set: 71
Inclination: 98.8280 deg
RA of node: 268.7042 deg
Eccentricity: 0.0016171
Arg of perigee: 138.0415 deg
Mean anomaly: 222.1909 deg
Mean motion: 14.01315639 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 20533
Checksum: 285

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94249.01489895
Element set: 835
Inclination: 82.5210 deg
RA of node: 81.6755 deg
Eccentricity: 0.0012936
Arg of perigee: 175.7635 deg
Mean anomaly: 184.3668 deg
Mean motion: 13.83588735 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 19893

Checksum: 351

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94246.60325885
Element set: 731
Inclination: 82.5424 deg
RA of node: 114.1705 deg
Eccentricity: 0.0014309
Arg of perigee: 354.0476 deg
Mean anomaly: 6.0480 deg
Mean motion: 13.16464228 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16167
Checksum: 272

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94250.70514379
Element set: 171
Inclination: 98.6126 deg
RA of node: 276.6469 deg
Eccentricity: 0.0013361
Arg of perigee: 1.7209 deg
Mean anomaly: 358.4004 deg
Mean motion: 14.22444842 rev/day
Decay rate: 8.4e-07 rev/day^2
Epoch rev: 17223
Checksum: 284

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94250.95119570
Element set: 739
Inclination: 82.5488 deg
RA of node: 58.2862 deg
Eccentricity: 0.0013781
Arg of perigee: 356.1519 deg
Mean anomaly: 3.9492 deg
Mean motion: 13.16834104 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14735
Checksum: 314

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94243.24645844
Element set: 332
Inclination: 82.5514 deg
RA of node: 146.9692 deg
Eccentricity: 0.0023665

Arg of perigee: 18.4976 deg
Mean anomaly: 341.7038 deg
Mean motion: 13.83014037 rev/day
Decay rate: 8.9e-07 rev/day^2
Epoch rev: 5046
Checksum: 311

/EX
SB KEPS @ AMSAT $ORBS-252.M
Orbital Elements 252.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX September 9, 1994
BID: $ORBS-252.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94243.20371906
Element set: 313
Inclination: 98.6454 deg
RA of node: 318.3232 deg
Eccentricity: 0.0010119
Arg of perigee: 342.4454 deg
Mean anomaly: 17.6372 deg
Mean motion: 14.28038204 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 4840
Checksum: 266

Satellite: MIR
Catalog number: 16609
Epoch time: 94251.20537460
Element set: 751
Inclination: 51.6466 deg
RA of node: 131.0215 deg
Eccentricity: 0.0001551
Arg of perigee: 29.3923 deg
Mean anomaly: 330.7156 deg
Mean motion: 15.56960259 rev/day
Decay rate: 2.575e-05 rev/day^2
Epoch rev: 48895
Checksum: 298

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94251.17564075
Element set: 533
Inclination: 28.4700 deg
RA of node: 62.8744 deg
Eccentricity: 0.0006129
Arg of perigee: 234.9428 deg

Mean anomaly: 125.0586 deg
Mean motion: 14.90666428 rev/day
Decay rate: 4.55e-06 rev/day^2
Epoch rev: 4178
Checksum: 300

Satellite: GRO
Catalog number: 21225
Epoch time: 94250.71184672
Element set: 137
Inclination: 28.4634 deg
RA of node: 19.1121 deg
Eccentricity: 0.0003345
Arg of perigee: 73.0629 deg
Mean anomaly: 287.0534 deg
Mean motion: 15.41218139 rev/day
Decay rate: 2.466e-05 rev/day^2
Epoch rev: 6968
Checksum: 282

Satellite: UARS
Catalog number: 21701
Epoch time: 94245.53359212
Element set: 584
Inclination: 56.9840 deg
RA of node: 209.1014 deg
Eccentricity: 0.0004516
Arg of perigee: 108.4708 deg
Mean anomaly: 251.6814 deg
Mean motion: 14.96457348 rev/day
Decay rate: -2.164e-05 rev/day^2
Epoch rev: 16251
Checksum: 290

/EX

1379. orbs$252.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-09 14:13:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-252.n.1994@ampr.org>
Source record: 26983
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-252.N
2Line Orbital Elements 252.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX September 9, 1994
BID: $ORBS-252.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 83753
UO-11
1 14781U 84021B 94246.07218413 .00000057 00000-0 17474-4 0 7253
2 14781 97.7857 257.1497 0012609 25.2874 334.8945 14.69240533561743
RS-10/11
1 18129U 87054A 94249.07204211 .00000029 00000-0 14891-4 0 9549
2 18129 82.9209 269.0556 0012014 152.4193 207.7602 13.72340827361000
AO-13
1 19216U 88051B 94250.73996645 .00000271 00000-0 10000-4 0 9614
2 19216 57.7429 232.3061 7230985 349.7633 0.9499 2.09718556 47747
FO-20
1 20480U 90013C 94247.42862192 .00000042 00000-0 16291-3 0 7229
2 20480 99.0488 24.3224 0541357 159.9373 202.3927 12.83228220214296
AO-21
1 21087U 91006A 94251.01676119 .00000094 00000-0 82657-4 0 5100
2 21087 82.9364 81.4154 0033935 211.9250 147.9850 13.74544212180969
RS-12/13
1 21089U 91007A 94246.59078278 .00000029 00000-0 15038-4 0 7257
2 21089 82.9245 313.3082 0027684 249.8946 109.9234 13.74045561179417
ARSENE
1 22654U 93031B 94243.05287604 -.00000107 00000-0 00000 0 0 2754
2 22654 2.0332 96.0279 2914017 190.0489 163.3275 1.42202991 2266
UO-14
1 20437U 90005B 94246.24979174 .00000001 00000-0 17332-4 0 260
2 20437 98.5880 329.9585 0010966 326.7938 33.2550 14.29853612240743
AO-16
1 20439U 90005D 94243.22354761 .00000004 00000-0 18510-4 0 8233
```

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2 20439 98.5968 328.2876 0011378 336.3042 23.7623 14.29907282240320
DO-17
1 20440U 90005E 94246.24913465 -.00000003 00000-0 15899-4 0 8251
2 20440 98.5966 331.6231 0011315 326.6136 33.4328 14.30047248240778
WO-18
1 20441U 90005F 94243.21721374 .00000006 00000-0 19210-4 0 8266
2 20441 98.5975 328.6270 0012285 335.7331 24.3277 14.30021068240340
LO-19
1 20442U 90005G 94246.75849338 .00000013 00000-0 22094-4 0 8239
2 20442 98.5978 332.4001 0012219 324.7459 35.2913 14.30118615240865
UO-22
1 21575U 91050B 94246.12512292 -.00000003 00000-0 13583-4 0 5280
2 21575 98.4302 319.0283 0008689 59.0874 301.1166 14.36929252164279
KO-23
1 22077U 92052B 94243.11394838 -.00000037 00000-0 10000-3 0 4221
2 22077 66.0839 123.1079 0015430 270.1307 89.7937 12.86286549 96423
AO-27
1 22825U 93061C 94246.24191330 .00000014 00000-0 23661-4 0 3212
2 22825 98.6482 321.2471 0008932 346.8547 13.2395 14.27633083 48829
IO-26
1 22826U 93061D 94243.20374381 .00000003 00000-0 19182-4 0 3205
2 22826 98.6495 318.2912 0009468 356.6267 3.4849 14.27737479 48394
KO-25
1 22830U 93061H 94246.70054461 -.00000029 00000-0 55638-5 0 3275
2 22830 98.5472 318.1598 0011121 310.7839 49.2365 14.28061576 48904
22828
1 22828U 93061F 94246.70003989 .00000004 00000-0 19255-4 0 2995
2 22828 98.6425 321.7648 0010289 331.7229 28.3378 14.28064524 16987
NOAA-9
1 15427U 84123A 94250.77061508 .00000056 00000-0 53730-4 0 9455
2 15427 99.0435 302.1944 0015171 350.3917 9.6960 14.13639907501927
NOAA-10
1 16969U 86073A 94250.73664265 .00000017 00000-0 25499-4 0 8422
2 16969 98.5110 257.2257 0014132 87.2811 272.9991 14.24903883414252
MET-2/17
1 18820U 88005A 94250.39554426 .00000036 00000-0 18711-4 0 3915
2 18820 82.5412 203.1859 0015983 315.5211 44.4664 13.84720625333730
MET-3/2
1 19336U 88064A 94246.49018649 .00000051 00000-0 10000-3 0 3202
2 19336 82.5381 268.2735 0018539 67.2957 293.0126 13.16968553293561
NOAA-11
1 19531U 88089A 94250.70637069 .00000060 00000-0 57505-4 0 7620
2 19531 99.1810 241.6693 0011090 264.3496 95.6404 14.13014274306795
MET-2/18
1 19851U 89018A 94246.56910060 .00000020 00000-0 45419-5 0 3211
2 19851 82.5172 81.4335 0015197 11.7751 348.3746 13.84371453278539
MET-3/3
1 20305U 89086A 94247.84879149 .00000044 00000-0 10000-3 0 1373
2 20305 82.5512 214.8917 0007981 92.6591 267.5439 13.04426670233281
MET-2/19
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1 20670U 90057A 94246.22753404 -.00000084 00000-0 -88752-4 0 8243
2 20670 82.5492 146.4951 0014715 292.4370 67.5233 13.84182449211411
FY-1/2
1 20788U 90081A 94251.22505974 -.00000027 00000-0 10000-4 0 714
2 20788 98.8280 268.7042 0016171 138.0415 222.1909 14.01315639205330
MET-2/20
1 20826U 90086A 94249.01489895 .00000053 00000-0 34844-4 0 8357
2 20826 82.5210 81.6755 0012936 175.7635 184.3668 13.83588735198932
MET-3/4
1 21232U 91030A 94246.60325885 .00000050 00000-0 10000-3 0 7318
2 21232 82.5424 114.1705 0014309 354.0476 6.0480 13.16464228161678
NOAA-12
1 21263U 91032A 94250.70514379 .00000084 00000-0 57099-4 0 1713
2 21263 98.6126 276.6469 0013361 1.7209 358.4004 14.22444842172235
MET-3/5
1 21655U 91056A 94250.95119570 .00000051 00000-0 10000-3 0 7399
2 21655 82.5488 58.2862 0013781 356.1519 3.9492 13.16834104147355
MET-2/21
1 22782U 93055A 94243.24645844 .00000089 00000-0 67543-4 0 3329
2 22782 82.5514 146.9692 0023665 18.4976 341.7038 13.83014037 50463
POSAT
1 22829U 93061G 94243.20371906 .00000005 00000-0 19698-4 0 3134
2 22829 98.6454 318.3232 0010119 342.4454 17.6372 14.28038204 48405
MIR
1 16609U 86017A 94251.20537460 .00002575 00000-0 41773-4 0 7513
2 16609 51.6466 131.0215 0001551 29.3923 330.7156 15.56960259488952
HUBBLE
1 20580U 90037B 94251.17564075 .00000455 00000-0 30100-4 0 5336
2 20580 28.4700 62.8744 0006129 234.9428 125.0586 14.90666428 41782
GRO
1 21225U 91027B 94250.71184672 .00002466 00000-0 51524-4 0 1370
2 21225 28.4634 19.1121 0003345 73.0629 287.0534 15.41218139 69681
UARS
1 21701U 91063B 94245.53359212 -.00002164 00000-0 -16814-3 0 5842
2 21701 56.9840 209.1014 0004516 108.4708 251.6814 14.96457348162519
/EX
```

1380. WISP

Newsgroup: rec.radio.amateur.space
Date: 1994-09-09 16:59:36 UTC
From: Ron.Parsons@f40.n382.z1.fidonet.org
Message-ID: <779155296.AA01308@afarm.uucp>
Source record: 26984

WiSP is a Windows satellite pacsat tracking and data upload/download engine,
among other things. It is available on DRIG in Dallas.

Ron W5RKN

1381. * SpaceNews 12-Sep-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-09-09 18:47:06 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0912.1994@ampr.org>
Source record: 26990
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0912
* SpaceNews 12-Sep-94 *

BID: $SPC0912

=========
SpaceNews
=========

MONDAY SEPTEMBER 12, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited distribution.

* SpaceNews EDITOR ON WWCR *
============================
Mark you calendars and warm up your receivers for a ive radio interview
with the man behind the SpaceNews keyboard, John Magliacane, KD2BD. The
producers of "Spectrum", a radio program broadcast over shortwave radio
station WWCR, on 5810 KHz, in Nashville, Tennessee will feature an interview
with the editor and publisher of SpaceNews on Sunday 11-Sep-94 from 0300
to 0400 UTC (that's Saturday 10-Sep-94 10:00 PM to 11:00 PM Eastern Time).

"Spectrum" is a communications program that originates live from studios
in Holmdel, New Jersey, and features news and information regarding
shortwave listening, commercial broadcasting, scanning, and Amateur Radio.
During the interview, listeners will be given the opportunity to call into
Spectrum and ask questions of the guest.

WWCR broadcasts on shortwave with 100 kilowatts of transmitter power, over
1 million watts of effective radiated power, and provides a signal that
covers much of the world. In addition, those with TVRO ground stations can
receive "Spectrum" on the Galaxy 5 satellite, transponder 17, audio 5.8 MHz.

* FO-20 RETURNS TO MODE JD *
============================
FO-20 software reloading was successfully completed on 06-Sep-94 at
1800 UTC and FO-20 was commanded into mode JD. The following packet
frames were captured by KD2BD in New Jersey last Monday:

8J1JBS>BEACON <UI C>:
JAS1b RA 94/09/05 20:06:58
428 442 674 678 730 817 835 821 000 673
608 000 463 482 503 487 497 507 645 000
670 704 655 662 999 635 865 490 018 000
010 101 000 001 111 100 001 111 011 000

8J1JBS>BEACON <UI C>:
JAS1b M0 94/09/05 20:07:00
Mailbox is at your service from 94/09/05 05:10:00
The JD Transmitter is available in all orbits
during JD mode.

The mailbox is also in operation. Congratulations go to the spacecraft controllers for returning FO-20's digital transponder back to life after it had been reported as being lost forever.

Ground stations are encouraged to copy telemetry transmissions made by the satellite, and forward telemetry frames to the spacecraft controllers if the on-board computer should crash once again.

[Info via Kazu Sakamoto, JJ1WTK]

* HV AND T7 ON AO-13 *
==========
It's time for Eric Archer, WB6GYD, to take another trip to the lovely country of Italy. Eric plans to be in Rome the period of September 14-28 and will operate from the following locations:

HV3SJ Vatican City: Sept. 17/18
T70A Republic of San Marino: Sept 24/25

The operation at HV3SJ may not result in AO-13 contacts as Eric does not yet have permission to operate in the middle of the night. So at this point in time, AO-13 is questionable for HV3SJ. Eric will operate HF instead (if not satellite). HV3SJ now has a permanent FT-736R, 435 MHz Mirage amplifier and Landwehr LNA at their station. (FT-736R donation is courtesy of Yaesu USA, THANK YOU!!) Eric plans to help install some yagis to complete their permanent station.

Eric has permission to operate in the middle of the night at the RSM Radio Club location, so the operation there is definate. He will either sign as T70A or as T7/WB6GYD. Look for Eric at approximately 0000Z to 0500Z on Sept. 25. This seems to be the best operating time for AO-13.

[Info via Eric Archer, WB6GYD]

* W2YLV SK *
==========
John Snodgrass W2YLV has passed away. He was active on AO-10 & AO-13 CW. It is unclear whether John kept any skeds with people on AO-13, but this notice is for all his friends on AO-13. John was in his 70's and died of heart problems. He will be missed, especially by his friends on the radio.

[Info via Len Popyack, WF2V]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

OS1AMV DB2OS VU2JHM WF2V VE4KHS K5MBV WB8LUJ
Robert Munger

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
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/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
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Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1382. Re: listen in on space shuttle in Michigan?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-09 19:23:36 UTC
From: domonkos@access.digex.net
Message-ID: <w8CSkiubGMMN066yn@access.digex.net>
Source record: 26985
Cross-posted to: rec.radio.scanner,rec.radio.amateur.space

In article <34pk9t$5vu@oliver.rutgers.edu>, Dave Hensley wrote:
>
> >3,860 and 7,185 KHz
> >14,295 and 21,395 KHz
>
> >during the mission of STS-64
>
> Will any of the retransmissions be AM or will they all be SSB?
>
> Dave Hensley dah@alumina.rutgers.edu

Most likely SSB.

Andy N3LCW

1383. STS-64 SAREX Mission Begins

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 01:43:43 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.001.1994@ampr.org>
Source record: 26986
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.001
STS-64 SAREX Liftoff

Silver Spring, MD, September 9 1994 at 21:00 EDT

The Space Shuttle Discovery roared into the skies of the Kennedy Space Center today initiating the fourth Shuttle Amateur Radio Experient (SAREX) flight this year. The STS-64 mission, delayed by looming showers and clouds, was launched 1 hour 53 minutes later than originally planned. Liftoff of Discovery occurred at 22:22:55 UTC. The six member crew of STS-64 will spend 9 days on-orbit performing and supporting several flight experiments. These include atmospheric studies which will be performed using the LIDAR In-Space Technology Experiment (LITE), deploying and retrieving the Spartan-201-II astronomy satellite, and supporting the Robot Operated Materials Processing System (ROMPS) experiment.

Three of the crew members are ham radio operators. They are Shuttle Commander Dick Richards, KB5SIW, Pilot Blaine Hammond, KC5HBS, and Mission Specialist and Jerry Linenger, KC5HBR. The three will operate the SAREX in both voice and packet modes. SAREX is a secondary mid-deck payload that allows ham radio operators and school students the opportunity to talk to the astronauts while they are in orbit. Ten scheduled school group contacts with students in the US and New Zealand are planned. The SAREX Working Group expects the SAREX payload to be configured and operational approximately 22 hours into the flight or at approximately 20:22 UTC on September 10. Please note that Shuttle power conservation measures, required to support an extra (10th) day of flight, is expected to result in the packet radio system being turned on later than what usually occurs in a typical SAREX mission. Listen on the downlink frequency (145.55 MHz) for the packet system BEFORE sending packet connects to the Space Shuttle.

The following Keplerian element set, JSC-012, which was developed by Gil Carman, WA5NOM, is the official SAREX element set for today.

STS-64
1 23251U 94059A 94253.17923136 .00083204 00000-0 14200-3 0 128
2 23251 57.0058 223.4928 0009244 269.5211 90.4820 16.05202670 52

Satellite: STS-64
Catalog number: 23251
Epoch time: 94253.17923136 = (10 SEP 94 04:18:05.59 UTC)
Element set: 012
Inclination: 57.0058 deg

RA of node: 223.4928 deg Space Shuttle Flight STS-64
Eccentricity: .0009244 Keplerian element set JSC-012
Arg of perigee: 269.5211 deg Launch: 09 SEP 22:22:55 UTC
Mean anomaly: 90.4820 deg
Mean motion: 16.05202670 rev/day Gil Carman
Decay rate: 8.3204e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 5
Checksum: 263

These elements will propagate to match the nominal planned trajectory
with respect to Mission elapsed time, and have been adjusted to
reflect the actual launch time of 22:22:55.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX

1384. STS-65 Orbital State Vector Rev #1

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 02:10:55 UTC
From: astroman@netcom.com
Message-ID: <astromanCvw628.F7F@netcom.com>
Source record: 26991
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

S H U T T L E V E C T O R D A T A

Below is the rev 1 Earth-Fixed Greenwich (EFG), State Vector for STS-65.
This vector comes from NASA Goddard Space Flight Center (GSFC) and is
provided courtesy of the DOD C-Band Radar Network.

The data between the dotted lines may be read directly by VEC2TLE to
estimate
the Keplerian Elements for STS-64 in NASA Two-Line (TLE) format. The
VEC2TLE
software is available from a variety of sources including AMSAT-NA, the NASA
Spacelink BBS (205) 895-0028 and at the following Internet FTP address:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip -- VEC2TLE may be
registered
free of charge for hobby use.

.....
Vector format = 117
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94252.95914359954
09/09/1994 23:01:10.006 UTC
EFG E: 9455000.23 ft
F: 19240089.33 ft
G: 3826309.31 ft
Edot: -9573.6334 ft/s
Fdot: 8859.0737 ft/s
Gdot: -20863.2123 ft/s
ndot/2 (drag): 0.00072371545 rev/day^2
nddt/6: 2.17448E-08 rev/day^3
Bstar: 9.81345E-05 1/Earth Radii
Elset #: 1
Rev @ Epoch: 1.46635786768
.....

The drag values are estimated by VEC2TLE using a 1.0 drag multipier.

To create a file for use by VEC2TLE, simply write the data between the
dotted lines to a new (text) file. I recommend that the file you save
have a .VIF extension (default for VEC2TLE vector input files).

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM

1385. Two-Line Orbital Element Sets (TLE464)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 02:15:21 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779163321@afit.af.mil>
Source record: 26987

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #464 -
Alouette 1
1 00424U 62049 94246.39518460 .00000055 00000-0 54275-4 0 271
2 00424 80.4616 207.8325 0021963 275.4047 84.4592 13.67817809593092
ATS 1
1 02608U 66110A 94249.53724428 -.00000293 00000-0 10000-3 0 9060
2 02608 14.5927 359.6395 0009959 51.7405 82.5214 1.00347651 18288
ATS 3
1 03029U 67111A 94251.23896617 -.00000120 00000-0 10000-3 0 2499
2 03029 14.7044 6.6274 0009445 263.4796 57.7758 1.00272956 98266
Cosmos 398
1 04966U 71016A 94251.26222918 .00082459 68041-5 15369-3 0 4919
2 04966 51.4497 359.0534 0951237 254.0289 95.4366 14.05941222784364
Starlette
1 07646U 75010A 94245.29624722 -.00000141 00000-0 -13029-6 0 8138
2 07646 49.8261 209.0715 0206082 230.8849 127.3522 13.82187012988517
LAGEOS
1 08820U 76039A 94251.09886709 .00000002 00000-0 10000-3 0 336
2 08820 109.8147 163.9864 0045530 267.8259 91.7006 6.38663545172440
ETS-2
1 09852U 77014A 94250.81000645 -.00000200 00000-0 10000-3 0 9871
2 09852 12.3015 40.5281 0003278 70.3974 83.8461 1.00000376 11153
GOES 2
1 10061U 77048A 94251.27979556 .00000065 00000-0 00000+0 0 4079
2 10061 11.3497 44.7083 0002578 47.6613 220.3596 1.00261151 7944
IUE
1 10637U 78012A 94249.58368218 -.00000216 00000-0 10000-3 0 438
2 10637 34.7379 93.5887 1318109 38.3936 9.3523 1.00242231 13547
GPS BI-01
1 10684U 78020A 94238.41313766 -.00000027 00000-0 10000-3 0 2945
2 10684 64.6871 43.4315 0062522 163.5099 196.7019 1.98069604106321
```

```
GPS BI-02
1 10893U 78047A 94243.14406775 .00000032 00000-0 10000-3 0 971
2 10893 63.4912 282.0143 0215166 14.0487 346.6201 2.01627581119581
GOES 3
1 10953U 78062A 94250.52201478 .00000042 00000-0 10000-3 0 3703
2 10953 10.2923 47.4836 0006173 74.8706 233.6268 1.00267731 12547
SeaSat 1
1 10967U 78064A 94246.24212389 -.00000069 00000-0 21806-4 0 3221
2 10967 107.9999 263.7480 0001924 236.9587 123.1369 14.37974742847580
GPS BI-03
1 11054U 78093A 94244.21402911 .00000046 00000-0 10000-3 0 2145
2 11054 63.1851 279.4988 0044982 176.7703 183.3397 1.93503657115989
Nimbus 7
1 11080U 78098A 94246.69282567 -.00000114 00000-0 -64822-4 0 4261
2 11080 99.0440 127.3475 0008415 284.8927 75.1297 13.83725950800939
GPS BI-04
1 11141U 78112A 94248.71605468 .00000001 00000-0 00000+0 0 9182
2 11141 64.7022 44.4943 0048335 26.9998 333.2522 1.92894426 5331
GPS BI-05
1 11690U 80011A 94242.70371583 .00000011 00000-0 10000-3 0 8290
2 11690 65.0483 45.0488 0142048 195.8516 163.7322 2.00557786121039
GPS BI-06
1 11783U 80032A 94246.14514710 .00000053 00000-0 10000-3 0 39
2 11783 62.6188 275.5864 0211387 29.1696 332.0939 2.03457979105545
GOES 5
1 12472U 81049A 94250.85962214 -.00000064 00000-0 10000-3 0 7943
2 12472 6.9976 57.1186 0006521 24.4697 101.4387 1.00338592 6594
Cosmos 1383
1 13301U 82066A 94246.94606912 .00000024 00000-0 10535-4 0 3259
2 13301 82.9284 252.0050 0025909 237.2528 122.6132 13.68057477608190
LandSat 4
1 13367U 82072A 94250.73932084 .00000022 00000-0 15022-4 0 5315
2 13367 98.1731 307.7590 0007485 6.7071 353.4220 14.57127204646083
IRAS
1 13777U 83004A 94250.50707993 -.00000212 00000-0 -11615-3 0 7060
2 13777 98.9726 79.7505 0013014 88.3450 271.9203 13.99204972262659
Cosmos 1447
1 13916U 83021A 94246.24148786 .00000032 00000-0 17919-4 0 4260
2 13916 82.9469 313.9719 0037523 169.4086 190.7864 13.74313440574053
TDRS 1
1 13969U 83026B 94248.99513793 -.00000193 00000-0 10000-3 0 3396
2 13969 7.8557 50.2574 0008792 99.9841 277.4520 1.00263695 14869
GOES 6
1 14050U 83041A 94250.79734495 .00000037 00000-0 10000-3 0 2665
2 14050 5.7857 60.0886 0004125 3.9690 82.1399 1.00236945 13614
OSCAR 10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
LandSat 5
1 14780U 84021A 94250.77637538 .00000025 00000-0 15549-4 0 1235
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2 14780 98.1561 308.8631 0005328 16.0321 344.1045 14.57139567559505
UoSat 2
1 14781U 84021B 94246.07218413 .00000057 00000-0 17474-4 0 7253
2 14781 97.7857 257.1497 0012609 25.2874 334.8945 14.69240533561743
GPS BI-09
1 15039U 84059A 94173.79744213 -.00000035 00000-0 32229-6 0 2148
2 15039 64.3262 41.1209 0082917 18.3905 18.0461 1.92286281 73439
Cosmos 1574
1 15055U 84062A 94246.30394721 .00000039 00000-0 25680-4 0 6264
2 15055 82.9579 7.4325 0027916 2.3800 357.7483 13.73609756511356
GPS BI-10
1 15271U 84097A 94249.40809855 .00000038 00000-0 10000-3 0 8513
2 15271 62.3193 275.6239 0146376 349.8457 9.9424 2.00586692 72233
Cosmos 1602
1 15331U 84105A 94242.85980704 .00000199 00000-0 20751-4 0 3164
2 15331 82.5323 7.7947 0019582 321.8084 38.1742 14.84448025535595
NOAA 9
1 15427U 84123A 94250.77061508 .00000056 00000-0 53730-4 0 9455
2 15427 99.0435 302.1944 0015171 350.3917 9.6960 14.13639907501927
GPS BI-11
1 16129U 85093A 94133.03123666 -.00000034 00000-0 00000+0 0 5972
2 16129 64.7386 44.3482 0175309 51.6925 308.6893 2.00409782 9450
Mir
1 16609U 86017A 94251.20537460 .00002575 00000-0 41773-4 0 7513
2 16609 51.6466 131.0215 0001551 29.3923 330.7156 15.56960259488952
SPOT 1
1 16613U 86019A 94249.79355167 .00000089 00000-0 62356-4 0 7218
2 16613 98.6821 321.9748 0001032 101.1843 258.9445 14.20062443128140
Cosmos 1766
1 16881U 86055A 94238.03891852 .00000202 00000-0 21560-4 0 2300
2 16881 82.5176 70.2958 0020085 2.3073 357.8230 14.83474895435818
EGP
1 16908U 86061A 94246.54439706 -.00000097 00000-0 00000+0 0 9242
2 16908 50.0107 203.5001 0011587 152.8915 207.2525 12.44410637 35141
NOAA 10
1 16969U 86073A 94250.73664265 .00000017 00000-0 25499-4 0 8422
2 16969 98.5110 257.2257 0014132 87.2811 272.9991 14.24903883414252
MOS-1
1 17527U 87018A 94250.83051940 .00000091 00000-0 99794-4 0 1204
2 17527 99.0276 317.7621 0001927 28.9616 331.1652 13.94906840384465
GOES 7
1 17561U 87022A 94249.16661907 -.00000054 00000-0 10000-3 0 44
2 17561 1.7196 74.7359 0003540 3.3810 214.2718 1.00274541 10783
Kvant-1
1 17845U 87030A 94250.82028605 -.00005871 00000-0 -73228-4 0 9791
2 17845 51.6460 132.9537 0001521 13.0003 347.2209 15.56949234488987
DMSP B5D2-3
1 18123U 87053A 94250.72150631 .00000030 00000-0 38136-4 0 6370
2 18123 98.7859 81.1971 0014026 309.4237 50.5698 14.15370594372768
RS-10/11
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1 18129U 87054A 94249.07204211 .00000029 00000-0 14891-4 0 9549
2 18129 82.9209 269.0556 0012014 152.4193 207.7602 13.72340827361000
Meteor 2-16
1 18312U 87068A 94243.27076381 .00000065 00000-0 45663-4 0 3230
2 18312 82.5571 152.3183 0010904 265.6880 94.3034 13.84036492355441
Meteor 2-17
1 18820U 88005A 94250.39554426 .00000036 00000-0 18711-4 0 3915
2 18820 82.5412 203.1859 0015983 315.5211 44.4664 13.84720625333730
DMSP B5D2-4
1 18822U 88006A 94250.53935037 .00000072 00000-0 50289-4 0 7454
2 18822 98.4337 102.0651 0006719 93.8146 266.3803 14.23116546342310
Glonass 34
1 19163U 88043A 94249.13272759 .00000060 00000-0 10000-3 0 9256
2 19163 65.0607 107.7315 0007802 141.6181 218.5620 2.13102507 48387
Glonass 36
1 19165U 88043C 94249.65781045 .00000057 00000-0 10000-3 0 3179
2 19165 65.0426 107.6845 0005140 3.6662 356.4097 2.13102380 49019
METEOSAT 3
1 19215U 88051A 94249.12456206 -.00000266 00000-0 10000-3 0 9858
2 19215 1.9052 71.8487 0000485 133.7632 109.7305 1.00278737 10724
AO-13
1 19216U 88051B 94250.73996645 .00000271 00000-0 10000-4 0 9614
2 19216 57.7429 232.3061 7230985 349.7633 0.9499 2.09718556 16248
OKEAN 1
1 19274U 88056A 94243.27442871 .00000193 00000-0 21165-4 0 9326
2 19274 82.5152 165.4150 0021081 118.5199 241.8141 14.82206774332208
Meteor 3-2
1 19336U 88064A 94246.49018649 .00000051 00000-0 10000-3 0 3202
2 19336 82.5381 268.2735 0018539 67.2957 293.0126 13.16968553293561
Glonass 39
1 19503U 88085C 94249.21498121 -.00000046 00000-0 10000-3 0 2216
2 19503 65.7627 346.6233 0006906 167.7886 192.2612 2.13102045 46498
NOAA 11
1 19531U 88089A 94250.70637069 .00000060 00000-0 57505-4 0 7620
2 19531 99.1810 241.6693 0011090 264.3496 95.6404 14.13014274306795
TDRS 2
1 19548U 88091B 94250.55766990 .00000088 00000-0 10000-3 0 25
2 19548 1.1883 76.5948 0001929 20.2805 279.3974 1.00282338 9026
Glonass 40
1 19749U 89001A 94244.09230363 .00000033 00000-0 10000-3 0 4240
2 19749 65.0077 107.4750 0006653 240.8432 119.1668 2.13101364 43891
Glonass 41
1 19750U 89001B 94250.71818983 .00000049 00000-0 10000-3 0 3288
2 19750 65.0076 107.3355 0006661 288.5363 71.5000 2.13102248 44055
GPS BII-01
1 19802U 89013A 94248.00114071 .00000024 00000-0 10000-3 0 9510
2 19802 55.1303 136.5457 0034819 130.5706 229.2659 2.00558788 40650
Akebono
1 19822U 89016A 94250.78308504 .00007410 00000-0 37928-3 0 3258
2 19822 75.0980 135.9034 3817839 230.1677 89.6011 7.79044352115725
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Meteor 2-18
1 19851U 89018A 94246.56910060 .00000020 00000-0 45419-5 0 3211
2 19851 82.5172 81.4335 0015197 11.7751 348.3746 13.84371453278539
MOP-1
1 19876U 89020B 94235.16877315 -.00000090 00000-0 10000-3 0 547
2 19876 0.5889 66.3303 0001586 67.8332 249.5795 1.00272944 834
TDRS 3
1 19883U 89021B 94249.02532407 -.00000277 00000-0 00000+0 0 9761
2 19883 0.0290 285.0910 0003487 16.2477 11.6587 1.00268981192607
GPS BII-02
1 20061U 89044A 94250.33575940 -.00000037 00000-0 10000-3 0 9614
2 20061 54.5989 313.0849 0136057 210.0786 149.2069 2.00564951 38447
Nadezhda 1
1 20103U 89050A 94250.67036043 .00000031 00000-0 16682-4 0 1147
2 20103 82.9585 226.9216 0039174 60.6366 299.8705 13.73842586259636
GPS BII-03
1 20185U 89064A 94250.66907414 .00000026 00000-0 00000+0 0 9694
2 20185 54.9487 137.0348 0011005 324.0743 35.9380 2.00565223 37026
GMS 4
1 20217U 89070A 94250.96106156 -.00000299 00000-0 10000-3 0 750
2 20217 0.4200 74.0372 0000827 32.7379 5.7846 1.00261561 18923
GPS BII-04
1 20302U 89085A 94246.21597616 .00000042 00000-0 00000+0 0 9646
2 20302 53.5286 253.4832 0006240 216.9039 143.0852 2.00567885 35739
Meteor 3-3
1 20305U 89086A 94247.84879149 .00000044 00000-0 10000-3 0 1373
2 20305 82.5512 214.8917 0007981 92.6591 267.5439 13.04426670233281
COBE
1 20322U 89089A 94249.05031002 -.00000032 00000-0 74043-5 0 464
2 20322 98.9721 264.1312 0009528 47.2148 312.9862 14.03436129245731
Kvant-2
1 20335U 89093A 94250.82028605 -.00005871 00000-0 -73228-4 0 319
2 20335 51.6460 132.9537 0001521 13.0003 347.2209 15.56949234488907
GPS BII-05
1 20361U 89097A 94250.71574080 .00000014 00000-0 00000+0 0 8417
2 20361 55.5856 79.0262 0075564 112.4841 248.3709 2.00560819 25306
SPOT 2
1 20436U 90005A 94250.83152352 .00000095 00000-0 65161-4 0 8365
2 20436 98.7129 324.0288 0001996 9.7891 350.3323 14.20036691239824
UO-14
1 20437U 90005B 94246.24979174 .00000001 00000-0 17332-4 0 260
2 20437 98.5880 329.9585 0010966 326.7938 33.2550 14.29853612240743
UO-15
1 20438U 90005C 94243.21214076 .00000005 00000-0 19249-4 0 8247
2 20438 98.5877 325.8521 0010323 339.8277 20.2494 14.29183054240225
PACSAT
1 20439U 90005D 94243.22354761 .00000004 00000-0 18510-4 0 8233
2 20439 98.5968 328.2876 0011378 336.3042 23.7623 14.29907282240320
DO-17
1 20440U 90005E 94246.24913465 -.00000003 00000-0 15899-4 0 8251
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2 20440 98.5966 331.6231 0011315 326.6136 33.4328 14.30047248240778
WO-18
1 20441U 90005F 94243.21721374 .00000006 00000-0 19210-4 0 8266
2 20441 98.5975 328.6270 0012285 335.7331 24.3277 14.30021068240340
LO-19
1 20442U 90005G 94246.75849338 .00000013 00000-0 22094-4 0 8239
2 20442 98.5978 332.4001 0012219 324.7459 35.2913 14.30118615240865
GPS BII-06
1 20452U 90008A 94245.13465744 .00000003 00000-0 10000-3 0 9456
2 20452 54.0474 193.3852 0055355 77.2743 283.2959 2.00557342 33690
MOS-1B
1 20478U 90013A 94250.73245643 .00000091 00000-0 10000-3 0 6764
2 20478 99.0292 321.8258 0001327 86.7182 273.4131 13.94904347154159
DEBUT
1 20479U 90013B 94247.44420277 .00000055 00000-0 18992-3 0 8217
2 20479 99.0473 24.4552 0541162 159.6157 202.7469 12.83324722214305
FO-20
1 20480U 90013C 94247.42862192 .00000042 00000-0 16291-3 0 7229
2 20480 99.0488 24.3224 0541357 159.9373 202.3927 12.83228220214296
MOS-1B R/B
1 20491U 90013D 94245.46755335 -.00000769 00000-0 -13850-2 0 434
2 20491 99.0195 69.7842 0470609 26.3528 336.0706 13.02976168216725
LACE
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TDRS 4
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1994050G
1 23209U 94050G 94249.92884485 .00000001 00000-0 00000+0 0 160
2 23209 64.8937 217.0359 5793401 296.3287 16.2208 4.23183780 1004
1994050H
1 23210U 94050H 94250.87513369 .00000031 00000-0 00000+0 0 150
2 23210 64.8285 216.7900 5792624 296.2850 16.2397 4.23167984 1042
1994051A
1 23211U 94051A 94249.97617360 -.00002205 00000-0 -46048-1 0 248
2 23211 62.8134 137.0728 7370772 288.4034 9.4113 2.00569638 305
1994051B
1 23212U 94051B 94250.63349216 .00368532 74977-5 73910-3 0 241
2 23212 62.8195 83.5501 0230600 124.1941 238.1402 15.66457235 2352
1994051C
1 23213U 94051C 94250.87404481 .00967921 76209-5 82507-3 0 311
2 23213 62.8070 82.4867 0242281 121.6904 240.8199 15.74462307 2399
1994051D
1 23214U 94051D 94237.11737476 .00000324 00000-0 10000-4 0 10
2 23214 62.8258 138.9933 7327174 288.2949 14.0466 2.06165762 44
1994052A
1 23215U 94052A 94250.82028605 -.00005871 00000-0 -73228-4 0 477
2 23215 51.6460 132.9537 0001521 13.0003 347.2209 15.56949234 2066
```

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1994052B
1 23216U 94052B 94239.73334392 .14573584 12556-4 14483-3 0 124
2 23216 51.6166 187.8188 0010919 134.6131 229.6921 16.50221201 350
1994051E
1 23217U 94051E 94243.72872808 .09313961 80266-5 33086-2 0 125
2 23217 62.7003 108.7785 0093588 126.0787 239.4347 16.14147635 1286
1994053A
1 23218U 94053A 94250.55709729 .00159903 69932-5 18022-3 0 281
2 23218 64.8121 145.5425 0103812 74.9860 286.2761 15.98851989 1944
1994053B
1 23219U 94053B 94250.82096271 .00776774 73372-5 34066-3 0 340
2 23219 64.8469 144.2459 0031756 71.5908 288.8752 16.20708374 2007
1994053C
1 23220U 94053C 94250.13130160 .00988624 67487-5 12759-2 0 187
2 23220 64.7494 148.9033 0187126 87.1126 275.2490 15.81222927 1822
1994053D
1 23221U 94053D 94250.23981548 .01048773 67203-5 12859-2 0 172
2 23221 64.8719 149.1251 0178706 85.6030 276.7726 15.83578778 1840
1994053E
1 23222U 94053E 94244.90182452 .00449869 64370-5 80501-3 0 67
2 23222 64.8666 168.3963 0248747 68.2502 301.5818 15.64242930 990
1994053F
1 23224U 94053F 94241.84082504 .04479178 75442-5 97185-3 0 53
2 23224 64.7542 177.8960 0038294 75.9891 285.1974 16.27829113 541
1994053G
1 23225U 94053G 94250.18920730 .00361568 72116-4 35622-3 0 289
2 23225 64.8361 146.9881 0021774 337.1429 22.9273 16.10528122 1904
1994053H
1 23226U 94053H 94250.86335291 .00736537 67029-5 10900-2 0 165
2 23226 64.7516 146.5621 0198456 68.4254 293.8192 15.77152238 1931
1994055A
1 23227U 94055A 94251.12390498 -.00000198 00000-0 00000+0 0 209
2 23227 0.7769 269.8752 0032027 196.4242 77.4496 1.00273732 145
1994055B
1 23228U 94055B 94250.73785321 .00292153 -68460-5 47841-3 0 187
2 23228 27.8736 260.9800 0614939 239.8999 113.9244 14.83093968 1600
1994055C
1 23229U 94055C 94241.26270554 .00006007 00000-0 12794-1 0 46
2 23229 24.0321 328.5625 7411573 179.7622 181.0360 2.06440064 33
1994056A
1 23230U 94056A 94250.75963198 -.00000078 00000-0 10000-3 0 241
2 23230 13.0648 97.5331 5216988 195.6139 138.8337 1.70229845 28
1994056B
1 23231U 94056B 94244.84223146 .00135593 15301-5 25749-2 0 78
2 23231 28.5891 128.0130 7096769 179.6456 187.8479 2.56789968 120
1994057A
1 23233U 94057A 94254.45955914 .00000217 00000-0 14135-3 0 71
2 23233 98.9195 309.5091 0012036 202.3641 157.7129 14.12532263 1814
1994057B
1 23234U 94057B 94248.65113511 .00001060 00000-0 59914-3 0 77
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2 23234 98.9189 303.7267 0011894 220.5208 135.1135 14.12364395 995
1994057C
1 23235U 94057C 94246.66821979 .00001011 00000-0 57195-3 0 65
2 23235 98.9217 301.7503 0008231 184.7241 175.3843 14.12415186 715
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

1386. SAREX Info Sheet

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 02:28:09 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.002.1994@ampr.org>
Source record: 26992
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.002
SAREX Info Sheet

STS-64 Shuttle Amateur Radio Experiment (SAREX)
Information Sheet

Mission: STS-64 Space Shuttle Discovery
Lidar In-Space Technology Experiment (LITE-1)
SPARTAN-201
Robot Operated Materials Processing System (ROMPS)

Launch: September 9, 1994, 22:22 UTC

Orbit: 57 degree inclination

Mission Length: 9 days (Nominal)

Amateur
Radio
Operators: Dick Richards, KB5SIW, Commander, Blaine Hammond, KC5HBS,
Pilot, and Jerry Linenger, KC5HBR, Mission Specialist

Modes: FM Voice
Prime callsign: KB5SIW

Packet Radio
Callsign: W5RRR-1

Frequencies: All operations in split mode. Do not transmit on
the downlink frequency.

Voice Freqs: Downlink: 145.55 MHz (Worldwide)
Uplinks: 144.91, 144.93, 144.95, 144.97, 144.99 MHz
(Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: the crew will not favor any specific uplink
frequency, so your ability to work the crew will
be the "luck of the draw"

Packet Freqs: Downlink: 145.55 MHz
Uplink: 144.49 MHz

Info: Goddard Amateur Radio Club, WA3NAN, Greenbelt Maryland,
SAREX Bulletins and Shuttle Retransmissions
3860 KHz, 7185 KHz, 14,295 KHz, 21,395 KHz, 28,650 KHz
and 147.45 MHz (FM)

ARRL Amateur Radio Station, W1AW, Newington, CT
SAREX News Bulletins
3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz
and 147.555 MHz (FM)

Also, bulletins available on internet, via AMSAT ANS,
Compuserve, and your local PBSS.

School Group Participation: 10 school groups will participate
in SAREX with pre-scheduled direct
and telebridge contacts. These include
nine in the U.S., and one in New Zealand.

QSLs: ARRL Headquarters
SAREX QSL (please indicate flight #, STS-XX)
225 Main Street
Newington, CT 06111
This address must be used for all future missions.

In order for the managing process to run smoothly, please include
the following information in your QSL or report: Shuttle flight
nur (STS-XX), date, time in UTC, frequency and mode (FM voice,
packet, sstv or fv). This documents the contact or listener
report. In addition, you must also include an SASE using a large,
business-sized envelope you wish to receive a card. No cards
are distributed without the proper post affixed or sufficient
IRCs included.

The following clubs have graciously volunteered their service for
handling QSL cards for the following missions:

STS-58 Connecticut DX Association
STS-60 Cowley County Amateur Radio Club, Kansas
STS-59 Orange Park Amateur Radio Club, Florida
STS-64 Nashua Area Radio Club, New Hampshire

Information provided by Frank H. Bauer, KA3HDO and Robert Inderbitzen, NQ1R
for the SAREX Working Group

/EX

1387. MIR INFO REQUESTED

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 05:56:00 UTC
From: bob.stanton@exchange.com
Message-ID: <2d.1778.599.0N8510A9@exchange.com>
Source record: 26988

From: bob.stanton@exchange.exchange.com
To : all
Subj: MIR INFO REQUESTED

Hello everyone,

I have been trying to contact the packet radio station on board
the MIR space station. Can someone tell me if and what I am doing
wrong? Lets start with my hardware:

Transmitter is a AZDEN PCS-6000H putting out 45 watts.
Antenna is a 2M vertical 8' above my 2nd story roof.
SWR is 1.4:1
My house is about 20' above sea level with some tall trees in
the front and back yards.
The TNC is a KPC3.

I am transmitting on 144.49 and receiving on 145.55. I am
listening for and attempting to connect to R8MIR-1.

I am running a Tandy 2500 SX/25 with PAKET 6.0 running.

Does anyone have any ideas?

Thnx & 73

de Bob KD4ARD

* QMPro 1.0 94-6871 * Eagles may fly but weasels aren't sucked into jets

1388. Radio Astronomy

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 14:09:39 UTC
From: Timothy Wietlispach <wietlispach@delphi.com>
Message-ID: <he7T3oL.wietlispach@delphi.com>
Source record: 26989

Does anyone know of any Amateur Radio Astronomy group?
Thanks

1389. SAREX Keps 9/10 at 15:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 15:46:58 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.003.1994@ampr.org>
Source record: 26993
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.003
SAREX Keps 9/10 at 15:30 UTC

Silver Spring, MD September 10, 1994 at 15:30 UTC

The following represents the latest Keplerian Elements as
generated by Gil Carman, WA5NOM, at the Johnson Space Center.

STS-64
1 23251U 94059A 94253.61508163 .00083204 00000-0 14200-3 0 137
2 23251 57.0087 221.4445 0009356 272.6550 87.3481 16.05232506 128

Satellite: STS-64
Catalog number: 23251
Epoch time: 94253.61508163 = (10 SEP 94 14:45:43.05 UTC)
Element set: 013
Inclination: 57.0087 deg
RA of node: 221.4445 deg Space Shuttle Flight STS-64
Eccentricity: .0009356 Keplerian element set JSC-013
Arg of perigee: 272.6550 deg from NASA flight Day 2 vector
Mean anomaly: 87.3481 deg
Mean motion: 16.05232506 rev/day Gil Carman
Decay rate: 8.3204e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 12
Checksum: 268

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1390. AOP-2 opinion?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 21:10:00 UTC
From: gws@n8emr.cmhnet.org
Message-ID: <1994Sep10.211000.7399@n8emr.cmhnet.org>
Source record: 26994
Cross-posted to: rec.radio.amateur.antenna,rec.radio.amateur.space

Anyone had a chance to take a look at the cushcraft AOP-2
oscar array? I have the AOP-1 array but have it down for repairs
and figured I might as well update. From the ads I have seen it look like
a couple more elements on 2mters and a much larger antenna on 440.

comments
--
Gary W. Sanders gws@n8emr.cmhnet.org, 72277,1325
N8EMR @ N8JYV (ip addr) 44.70.0.1 [Ohio AMPR address coordinator]
HAM BBS 614-895-2553 (1200/2400/V.32/PEP) Voice: 614-895-2552 (eves/weekends)

1391. FTP Site for KEPS??? Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 22:18:57 UTC
From: briane@goofy.iaccess.za
Message-ID: <34tbch$1pk@goofy.iaccess.za>
Source record: 26995

Thanks for taking the time to read this note.

Due to erratic newsfeeds etc, I am looking for an anonymous FTP site that carries uptodate KEPS for the Amateur interest satellites, STS missions, MIR, Hubbble etc. I would prefer one in the USA, but any site will do.

Please include the /pub/ham/... info if possible, it will save me a lot of logon time (and cost!).

Please e-mail me, or as a last resort post the replies to this newsgroup.

Muchly thanks in advance.

Cheerio,

Brian ZR5DTS Voice: ++27-31-7011201 (06:00-14:30 UTC)
Internet: briane@goofy.iaccess.za Fax: ++27-31-7090813 or 7018315
AX25 Packet: ZR5DTS@ZS5S.NTL.ZAF ICBM's: 29:51:05 S 30:53:59 E
****
I am glad I don't know everything, that way life isn't boring - Brian Ellse 94
......I wonder where STS-64 is now??? Damn outta date KEPS!!!!.............
****

1392. Re: MIR INFO REQUESTED

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 23:41:29 UTC
From: johanb01@TIGGER.STCLOUD.MSUS.EDU
Message-ID: <34tg79$rcc@urvile.MSUS.EDU>
Source record: 26998

In article <2d.1778.599.0N8510A9@exchange.com>, bob.stanton@exchange.com (Bob Stanton) writes:
>From: bob.stanton@exchange.exchange.com
>To : all
>Subj: MIR INFO REQUESTED
>
>Hello everyone,
>
> I have been trying to contact the packet radio station on board
> the MIR space station. Can someone tell me if and what I am doing
> wrong? Lets start with my hardware:
>
> Transmitter is a AZDEN PCS-6000H putting out 45 watts.
> Antenna is a 2M vertical 8' above my 2nd story roof.
> SWR is 1.4:1
> My house is about 20' above sea level with some tall trees in
> the front and back yards.
> The TNC is a KPC3.
>
> I am transmitting on 144.49 and receiving on 145.55. I am
> listening for and attempting to connect to R8MIR-1.
>
> I am running a Tandy 2500 SX/25 with PAKET 6.0 running.
>
>Does anyone have any ideas?
>
>Thnx & 73
>
>de Bob KD4ARD
>
>
> * QMPro 1.0 94-6871 * Eagles may fly but weasels aren't sucked into jets
Mir does not run duplex like STS missions do.
Set your X-crv to Xmit AND Rcv on 145.55. At least this was the way they
were set up last time I tried them, and I have connected once.
If they are runing duplex now, sorry for the wrong info.
73
Brad

1393. Re: MIR INFO REQUESTED

Newsgroup: rec.radio.amateur.space
Date: 1994-09-10 23:48:17 UTC
From: johanb01@TIGGER.STCLOUD.MSUS.EDU
Message-ID: <34tgk1$rgp@urvile.MSUS.EDU>
Source record: 26999

In article <34tg79$rcc@urvile.MSUS.EDU>, johanb01@TIGGER.STCLOUD.MSUS.EDU writes:
>In article <2d.1778.599.0N8510A9@exchange.com>, bob.stanton@exchange.com (Bob Stanton)
writes:
>>From: bob.stanton@exchange.exchange.com
>>To : all
>>Subj: MIR INFO REQUESTED
>>
>>Hello everyone,
>>
>> I have been trying to contact the packet radio station on board
>> the MIR space station. Can someone tell me if and what I am doing
>> wrong? Lets start with my hardware:
>>
>> Transmitter is a AZDEN PCS-6000H putting out 45 watts.
>> Antenna is a 2M vertical 8' above my 2nd story roof.
>> SWR is 1.4:1
>> My house is about 20' above sea level with some tall trees in
>> the front and back yards.
>> The TNC is a KPC3.
>>
>> I am transmitting on 144.49 and receiving on 145.55. I am
>> listening for and attempting to connect to R8MIR-1.
>>
>> I am running a Tandy 2500 SX/25 with PAKET 6.0 running.
>>
>>Does anyone have any ideas?
>>
>>Thnx & 73
>>
>>de Bob KD4ARD
>>
>>
>> * QMPro 1.0 94-6871 * Eagles may fly but weasels aren't sucked into jets

>Mir does not run duplex like STS missions do.
>Set your X-crv to Xmit AND Rcv on 145.55. At least this was the way they
>were set up last time I tried them, and I have connected once.
>If they are runing duplex now, sorry for the wrong info.
>73
>Brad
>
Sorry the sig line didn't come out on the first reply, here goes again.

---------------SCSU ACS Network Technician----------------
| Brad Johannes KB0HNN KB0HNN@NF0H.#CMN.MN.USA.NOAM |

| 13451 Ct.Rd.131 JOHANB01@TIGGER.STCLOUD.MSUS.EDU |
| Holdingford MN, 56340 (612)746-2452 KB0HNN-1 on 147.555|
_____STANDARD DISCLAMER APPLIES, MY VIEWS ARE MY OWN____/

1394. ARLK039 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-09-11 00:40:16 UTC
From: w1aw@arrl.org
Message-ID: <$arlk039.1994@ampr.org>
Source record: 26996
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK039
ARLK039 Keplerian data

ZCZC SK07
QST de W1AW
Keplerian Bulletin 39 ARLK039
From ARRL Headquarters
Newington, CT September 11, 1994
To all radio amateurs

SB KEP ARL ARLK039
ARLK039 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-64
1 99964U 94253.10081708 .00050370 00000-0 49595-4 0 76
2 99964 57.0058 195.1863 0009249 269.4972 90.5059 16.05179220 56
AO-10
1 14129U 83058B 94215.22805310 -.00000302 00000-0 10000-3 0 2952
2 14129 27.0009 314.8290 6026240 199.5326 120.6764 2.05881876 55785
RS-10/11
1 18129U 87054A 94245.13494277 .00000018 00000-0 28619-5 0 9503
2 18129 82.9227 271.9677 0011527 163.1975 196.9559 13.72340699360467
UO-11
1 14781U 84021B 94242.05407815 .00000009 00000-0 94214-5 0 7247
2 14781 97.7858 253.3200 0012823 37.2927 322.9161 14.69239557561151
RS-12/13
1 21089U 91007A 94242.58574686 .00000049 00000-0 36517-4 0 7242
2 21089 82.9246 316.2773 0027677 261.9904 97.8111 13.74045626178867
AO-13
1 19216U 88051B 94244.06465693 -.00000319 00000-0 10000-4 0 9576
2 19216 57.7457 233.4755 7231019 349.2254 1.1276 2.09726877 16100
UO-14
1 20437U 90005B 94242.19112035 .00000012 00000-0 21614-4 0 254
2 20437 98.5882 325.9562 0011195 338.6747 21.3973 14.29853286240161
AO-16
1 20439U 90005D 94243.22354761 .00000004 00000-0 18510-4 0 8233
2 20439 98.5968 328.2876 0011378 336.3042 23.7623 14.29907282240320
```

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DO-17
1 20440U 90005E 94242.19101324 -.00000002 00000-0 16333-4 0 8246
2 20440 98.5966 327.6156 0011538 338.5461 21.5240 14.30046939240192
WO-18
1 20441U 90005F 94243.21721374 .00000006 00000-0 19210-4 0 8266
2 20441 98.5975 328.6270 0012285 335.7331 24.3277 14.30021068240340
LO-19
1 20442U 90005G 94242.28078981 .00000002 00000-0 17882-4 0 8227
2 20442 98.5981 327.9775 0012453 337.8186 22.2455 14.30117960240227
FO-20
1 20480U 90013C 94242.36051676 .00000014 00000-0 99901-4 0 7201
2 20480 99.0483 20.2052 0540713 171.3929 189.6913 12.83227880213646
AO-21
1 21087U 91006A 94243.59191079 .00000093 00000-0 82657-4 0 5076
2 21087 82.9402 86.9165 0033651 233.2799 126.5239 13.74543749179948
UO-22
1 21575U 91050B 94241.73824273 .00000035 00000-0 26496-4 0 5277
2 21575 98.4306 314.7329 0008686 70.4243 289.7874 14.36929130163642
KO-23
1 22077U 92052B 94243.11394838 -.00000037 00000-0 10000-3 0 4221
2 22077 66.0839 123.1079 0015430 270.1307 89.7937 12.86286549 96423
KO-25
1 22830U 93061H 94242.21639135 -.00000008 00000-0 14107-4 0 3265
2 22830 98.5471 313.7710 0011188 324.2674 35.7752 14.28061512 48269
KO-25?
1 22828U 93061F 94242.63629114 .00000021 00000-0 26070-4 0 2988
2 22828 98.6425 317.7435 0010301 343.9905 16.0951 14.28064245 16405
IO-26
1 22826U 93061D 94243.20374381 .00000003 00000-0 19182-4 0 3205
2 22826 98.6495 318.2912 0009468 356.6267 3.4849 14.27737479 48394
AO-27
1 22825U 93061C 94241.75642219 .00000007 00000-0 20508-4 0 3208
2 22825 98.6479 316.8078 0009042 359.3250 0.7917 14.27632689 48182
PO-28
1 22829U 93061G 94243.20371906 .00000005 00000-0 19698-4 0 3134
2 22829 98.6454 318.3232 0010119 342.4454 17.6372 14.28038204 48405
Mir
1 16609U 86017A 94245.23608396 .00003349 00000-0 52437-4 0 7357
2 16609 51.6468 160.9012 0001260 9.1290 350.9726 15.56885593488022

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
September 13, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1395. STS-64 Orbital State Vector Rev #14

Newsgroup: rec.radio.amateur.space
Date: 1994-09-11 01:12:35 UTC
From: astroman@netcom.com
Message-ID: <astromanCvxy0z.6Ep@netcom.com>
Source record: 26997
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

S H U T T L E V E C T O R D A T A

Below is the rev 14 Earth-Fixed Greenwich (EFG) State Vector for STS-64.
This vector comes from NASA Goddard Space Flight Center and is provided
courtesy of the DOD C-Band Radar Network.

The data between the dotted lines may be read directly by VEC2TLE to
estimate
the Keplerian Elements for STS-64 in NASA Two-Line (TLE) format. The
VEC2TLE
software is available from a variety of sources including AMSAT-NA and the
NASA Spacelink BBS (205) 895-0028 and may be registered free of charge
for
hobby use.

.....
Vector format = 117
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94253.75321787037
09/10/1994 18:04:38.024 UTC
EFG E: 10758839.41 ft
F: 6162208.25 ft
G: 17900246.29 ft
Edot: -16911.3224 ft/s
Fdot: 17292.1830 ft/s
Gdot: 4209.6829 ft/s
ndot/2 (drag): 0.00074284453 rev/day^2
nddt/6: 2.29147E-08 rev/day^3
Bstar: 1.02923E-04 1/Earth Radii
Elset #: 4
Rev @ Epoch: 14.21836457971
.....

The drag values are estimated by VEC2TLE using a 1.0 drag multiplier.

To create a file for use by VEC2TLE, simply write the data between the
dotted lines to a new (text) file. I recommend that the file you save
the data have a .VIF extension (default for VEC2TLE vector input files).

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM

1396. Shuttle Rise-Set Times

Newsgroup: rec.radio.amateur.space
Date: 1994-09-11 10:26:12 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.004.1994@ampr.org>
Source record: 27000
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.004
STS-64 Eastern R/S Times 09/11

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbtiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part
of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Atlanta GA

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 06:11:29 342 06:15:05 43 12 06:18:40 104 22 01:07:48:34
11Sep94 07:44:17 302 07:47:53 237 16 07:51:28 172 23 01:09:21:22
11Sep94 22:14:57 219 22:19:08 7 82 22:23:01 39 33 01:23:52:02
12Sep94 06:06:25 334 06:10:18 43 21 06:14:11 117 38 02:07:43:30
12Sep94 07:39:49 291 07:43:06 236 9 07:46:05 188 39 02:09:16:54
12Sep94 22:10:10 231 22:14:03 302 37 22:18:15 32 49 02:23:47:15
13Sep94 06:01:26 328 06:05:20 37 38 06:09:31 130 54 03:07:38:31
13Sep94 20:33:18 174 20:36:35 121 9 20:39:52 67 64 03:22:10:23
13Sep94 22:05:30 244 22:09:05 310 20 22:12:58 24 65 03:23:42:35

Miami FL

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 06:14:05 359 06:17:04 45 6 06:20:03 93 22 01:07:51:10
11Sep94 07:46:17 308 07:50:10 233 20 07:53:45 169 23 01:09:23:22
11Sep94 20:42:03 175 20:45:20 121 10 20:48:37 65 32 01:22:19:08
11Sep94 22:14:33 249 22:18:08 312 13 22:21:43 12 33 01:23:51:38
12Sep94 06:08:54 349 06:12:29 50 12 06:16:04 110 38 02:07:45:59
12Sep94 07:41:42 298 07:45:17 237 10 07:48:34 183 39 02:09:18:47
12Sep94 20:36:52 189 20:40:27 121 19 20:44:20 52 48 02:22:13:57
12Sep94 22:10:16 264 22:13:15 312 7 22:16:15 1 49 02:23:47:21

13Sep94 06:03:43 340 06:07:36 53 22 06:11:30 124 54 03:07:40:48
13Sep94 20:31:23 204 20:35:16 130 41 20:39:28 42 64 03:22:08:28

New York NY

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 00:00:00 336 00:00:00 336 8 00:02:59 22 18 01:01:37:05
11Sep94 04:38:42 334 04:42:17 34 11 04:45:35 90 21 01:06:15:47
11Sep94 06:11:12 309 06:15:23 220 38 06:19:16 150 22 01:07:48:17
11Sep94 20:46:50 162 20:49:32 119 5 20:52:13 78 32 01:22:23:55
11Sep94 22:17:51 231 22:21:44 303 54 22:25:55 41 33 01:23:54:56
11Sep94 23:52:26 290 23:55:08 333 6 23:58:07 19 34 02:01:29:31
12Sep94 04:33:50 330 04:37:43 41 16 04:41:18 102 37 02:06:10:55
12Sep94 06:06:38 302 06:10:31 228 21 06:14:06 163 38 02:07:43:43
12Sep94 20:41:04 179 20:44:22 125 10 20:47:39 69 48 02:22:18:09
12Sep94 22:12:58 242 22:16:52 312 29 22:21:03 36 49 02:23:50:03
13Sep94 04:28:40 325 04:32:51 45 24 04:36:44 114 53 03:06:05:45
13Sep94 06:01:45 295 06:05:21 236 12 06:08:56 175 54 03:07:38:50
13Sep94 20:35:36 192 20:39:11 129 16 20:43:05 60 64 03:22:12:41
13Sep94 22:08:06 253 22:11:59 322 19 22:15:46 32 65 03:23:45:11

Washington DC

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 00:00:00 348 00:00:00 348 6 00:02:06 18 18 01:01:37:05
11Sep94 04:39:05 345 04:42:05 33 6 04:44:46 75 21 01:06:16:10
11Sep94 06:11:00 317 06:15:11 347 85 06:19:22 138 22 01:07:48:05
11Sep94 22:17:09 228 22:21:02 307 60 22:25:13 40 33 01:23:54:14
11Sep94 23:51:44 290 23:54:26 331 5 23:57:07 13 34 02:01:28:49
12Sep94 04:34:07 340 04:37:24 35 9 04:40:42 89 37 02:06:11:12
12Sep94 06:06:19 311 06:10:30 222 42 06:14:24 150 38 02:07:43:24
12Sep94 20:40:28 173 20:43:45 120 8 20:46:45 72 48 02:22:17:33
12Sep94 22:12:22 240 22:16:15 320 31 22:20:08 34 49 02:23:49:27
13Sep94 04:28:51 334 04:32:26 34 14 04:36:01 99 53 03:06:05:56
13Sep94 06:01:39 304 06:05:32 228 22 06:09:07 163 54 03:07:38:44
13Sep94 20:34:54 187 20:38:29 126 14 20:42:04 62 64 03:22:11:59
13Sep94 22:07:24 250 22:11:17 322 19 22:15:05 30 65 03:23:44:29

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Send comments to kc6rol@amsat.org
/EX

SB SAREX @ AMSAT $STS-64.005
STS-64 Central R/S Times 09/11

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbtiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part
of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Chicago IL

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 00:00:00 30 00:00:00 30 10 00:01:48 39 18 01:01:37:05
11Sep94 01:28:19 294 01:31:18 340 5 01:34:00 21 19 01:03:05:24
11Sep94 06:09:06 322 06:13:18 47 32 06:17:11 118 22 01:07:46:11
11Sep94 07:42:30 290 07:45:48 235 10 07:49:05 180 23 01:09:19:35
11Sep94 22:16:39 191 22:20:14 129 16 22:24:07 61 33 01:23:53:44
11Sep94 23:49:09 251 23:53:02 323 22 23:56:55 35 34 02:01:26:14
12Sep94 04:32:02 337 04:35:01 24 7 04:38:01 72 37 02:06:09:07
12Sep94 06:04:14 317 06:08:25 43 58 06:12:19 128 38 02:07:41:19
12Sep94 07:37:56 282 07:40:55 237 5 07:43:37 195 39 02:09:15:01
12Sep94 22:11:29 203 22:15:22 128 26 22:19:15 56 49 02:23:48:34
12Sep94 23:44:35 262 23:48:10 324 15 23:52:03 32 50 03:01:21:40
13Sep94 04:26:52 333 04:30:27 32 9 04:33:45 84 53 03:06:03:57
13Sep94 05:59:22 313 06:03:33 208 69 06:07:26 140 54 03:07:36:27
13Sep94 22:06:25 215 22:10:18 126 50 22:14:25 50 65 03:23:43:30
13Sep94 23:39:56 273 23:43:20 330 11 23:46:40 27 66 04:01:17:01

Denver CO

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 01:24:19 261 01:27:55 324 14 01:31:30 27 19 01:03:01:24
11Sep94 07:39:54 322 07:44:06 52 43 07:47:59 126 23 01:09:16:59
11Sep94 09:13:36 284 09:16:36 236 6 09:19:17 194 24 01:10:50:41
11Sep94 23:46:15 212 23:50:08 136 44 23:54:20 49 34 02:01:23:20
12Sep94 01:19:57 272 01:23:14 326 9 01:26:32 21 35 02:02:57:02
12Sep94 06:03:02 343 06:06:01 31 7 06:09:01 78 38 02:07:40:07
12Sep94 07:35:14 316 07:39:07 320 80 07:43:18 138 39 02:09:12:19
12Sep94 23:41:23 223 23:45:16 305 85 23:49:27 43 50 03:01:18:28
13Sep94 01:15:41 285 01:18:40 334 6 01:21:39 19 51 03:02:52:46
13Sep94 05:57:52 338 06:01:09 32 10 06:04:26 88 54 03:07:34:57
13Sep94 07:30:22 310 07:34:15 229 42 07:38:08 150 55 03:09:07:27
13Sep94 22:04:48 168 22:07:48 121 6 22:10:36 77 65 03:23:41:53

13Sep94 23:36:19 235 23:40:07 305 41 23:44:05 37 66 04:01:13:24

Houston TX

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 07:43:11 332 07:47:22 56 34 07:51:16 130 23 01:09:20:16
11Sep94 22:12:57 194 22:16:50 123 22 22:20:43 51 33 01:23:50:02
11Sep94 23:46:39 266 23:49:38 314 8 23:52:55 7 34 02:01:23:44
12Sep94 07:38:24 324 07:42:36 108 79 07:46:29 143 39 02:09:15:29
12Sep94 22:08:04 207 22:11:57 117 48 22:15:51 43 49 02:23:45:09
13Sep94 07:33:32 315 07:37:25 243 38 07:41:18 157 55 03:09:10:37
13Sep94 22:02:42 220 22:06:53 320 65 22:10:50 34 65 03:23:39:47

Huntsville AL

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 06:10:53 341 06:14:29 39 11 06:18:04 101 22 01:07:47:58
11Sep94 07:43:41 304 07:47:17 241 20 07:51:10 167 23 01:09:20:46
11Sep94 22:14:51 210 22:19:02 120 50 22:22:55 45 33 01:23:51:56
11Sep94 23:49:08 277 23:52:08 324 6 23:55:07 10 34 02:01:26:13
12Sep94 06:06:01 336 06:09:54 46 18 06:13:29 112 38 02:07:43:06
12Sep94 07:39:07 295 07:42:24 241 11 07:45:59 181 39 02:09:16:12
12Sep94 22:10:04 223 22:13:57 286 66 22:18:08 37 49 02:23:47:09
13Sep94 06:01:02 329 06:04:55 45 32 06:08:49 125 54 03:07:38:07
13Sep94 07:34:44 283 07:37:25 241 5 07:40:07 198 55 03:09:11:49
13Sep94 20:33:47 163 20:36:29 121 5 20:39:28 75 64 03:22:10:52
13Sep94 22:05:06 235 22:08:59 310 32 22:13:09 31 65 03:23:42:11

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/EX

SB SAREX @ AMSAT $STS-64.006
STS-64 Western R/S Times 09/11

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbtiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part
of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit

Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Albuquerque NM

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 01:23:44 271 01:27:01 325 8 01:30:00 12 19 01:03:00:49
11Sep94 07:40:54 337 07:44:29 40 16 07:48:22 110 23 01:09:17:59
11Sep94 09:13:42 299 09:17:17 238 13 09:20:52 176 24 01:10:50:47
11Sep94 23:44:57 217 23:49:08 85 79 23:53:02 41 34 02:01:22:02
12Sep94 07:35:55 331 07:39:49 44 27 07:43:42 122 39 02:09:13:00
12Sep94 09:09:19 288 09:12:19 241 7 09:15:18 193 40 02:10:46:24
12Sep94 23:40:17 230 23:44:10 312 43 23:48:03 34 50 03:01:17:22
13Sep94 07:30:57 324 07:34:50 36 54 07:39:01 134 55 03:09:08:02
13Sep94 22:03:24 173 22:06:42 118 8 22:09:48 69 65 03:23:40:29
13Sep94 23:35:12 241 23:39:01 309 23 23:42:41 26 66 04:01:12:17

Honolulu HI

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 02:45:39 215 02:49:33 306 77 02:53:26 32 20 01:04:22:44
11Sep94 12:14:48 339 12:18:59 62 27 12:22:34 130 26 01:13:51:53
12Sep94 02:40:47 228 02:44:40 299 29 02:48:33 21 36 02:04:17:52
12Sep94 12:09:55 329 12:14:06 81 68 12:18:00 144 42 02:13:47:00
13Sep94 01:04:29 164 01:07:11 120 6 01:10:10 72 51 03:02:41:34
13Sep94 02:36:24 244 02:39:59 310 14 02:43:34 11 52 03:04:13:29
13Sep94 12:05:02 319 12:08:56 244 41 12:12:49 158 58 03:13:42:07

Los Angeles CA

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 01:21:02 240 01:24:55 318 25 01:28:49 28 19 01:02:58:07
11Sep94 09:12:00 322 09:16:11 83 72 09:20:05 139 24 01:10:49:05
11Sep94 23:43:52 184 23:47:27 121 14 23:51:02 60 34 02:01:20:57
12Sep94 01:16:40 253 01:20:15 320 14 01:23:50 21 35 02:02:53:45
12Sep94 07:35:19 353 07:38:19 41 6 07:41:00 83 39 02:09:12:24
12Sep94 09:07:14 315 09:11:07 247 45 09:15:18 152 40 02:10:44:19
12Sep94 23:38:41 198 23:42:34 118 25 23:46:27 51 50 03:01:15:46
13Sep94 01:12:05 265 01:15:22 320 9 01:18:39 14 51 03:02:49:10
13Sep94 07:29:51 344 07:33:26 43 10 07:36:43 97 55 03:09:06:56
13Sep94 09:02:21 307 09:06:14 236 22 09:10:07 164 56 03:10:39:26
13Sep94 23:33:30 210 23:37:23 119 54 23:41:21 44 66 04:01:10:35

Seattle WA

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 01:23:08 196 01:26:43 135 16 01:30:36 66 19 01:03:00:13
11Sep94 02:55:38 250 02:59:31 327 34 03:03:42 48 20 01:04:32:43
11Sep94 04:29:37 292 04:32:55 347 11 04:36:30 47 21 01:06:06:42
11Sep94 06:03:19 313 06:06:37 7 10 06:10:12 67 22 01:07:40:24
11Sep94 07:36:07 312 07:40:18 35 30 07:44:12 107 23 01:09:13:12
11Sep94 09:09:13 296 09:13:06 222 19 09:16:42 160 24 01:10:46:18
12Sep94 01:18:09 207 01:22:03 132 25 01:25:56 61 35 02:02:55:14
12Sep94 02:50:57 259 02:54:51 332 24 02:58:44 46 36 02:04:28:02
12Sep94 04:24:57 297 04:28:14 350 10 04:31:50 49 37 02:06:02:02
12Sep94 05:58:39 315 06:02:14 17 11 06:05:31 72 38 02:07:35:44
12Sep94 07:31:27 311 07:35:20 21 44 07:39:31 116 39 02:09:08:32
12Sep94 09:04:33 290 09:08:08 229 12 09:11:25 172 40 02:10:41:38
13Sep94 01:12:59 218 01:17:10 126 42 01:21:04 57 51 03:02:50:04
13Sep94 02:46:05 266 02:49:58 334 19 02:53:52 45 52 03:04:23:10
13Sep94 04:20:23 303 04:23:40 358 9 04:26:57 51 53 03:05:57:28
13Sep94 05:53:47 316 05:57:22 18 13 06:00:57 80 54 03:07:30:52
13Sep94 07:26:35 308 07:30:28 11 72 07:34:39 125 55 03:09:03:40
13Sep94 08:59:58 282 09:02:58 234 8 09:05:57 185 56 03:10:37:03
13Sep94 23:37:07 164 23:39:48 121 5 23:42:20 83 66 04:01:14:12

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/EX

SB SAREX @ AMSAT $STS-64.007
STS-65 World R/S Times 07/18

Below are the rise and set times for STS-64 for selected worldwide cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbtiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part
of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

London UK

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 00:08:22 297 00:12:34 210 42 00:16:27 136 18 01:01:45:27
11Sep94 17:51:24 217 17:55:18 149 30 17:59:29 65 30 01:19:28:29
11Sep94 19:24:12 260 19:28:24 348 35 19:32:17 59 31 01:21:01:17

11Sep94 20:57:36 289 21:01:29 357 20 21:05:23 71 32 01:22:34:41
11Sep94 22:30:42 300 22:34:53 22 37 22:38:47 101 33 02:00:07:47
12Sep94 00:03:48 294 00:07:41 220 27 00:11:35 146 34 02:01:40:53
12Sep94 17:46:32 226 17:50:25 156 46 17:54:37 63 46 02:19:23:37
12Sep94 19:19:38 268 19:23:31 346 28 19:27:25 60 47 02:20:56:43
12Sep94 20:53:02 294 20:56:55 9 20 21:00:48 76 48 02:22:30:07
12Sep94 22:25:50 301 22:30:01 22 50 22:34:12 109 49 03:00:02:55
12Sep94 23:58:56 291 00:02:49 219 18 00:06:24 156 50 03:01:36:01
13Sep94 16:09:58 181 16:13:15 127 8 16:16:14 79 61 03:17:47:03
13Sep94 17:41:34 235 17:45:27 165 74 17:49:38 61 62 03:19:18:39
13Sep94 19:14:40 274 19:18:33 348 24 19:22:26 61 63 03:20:51:45
13Sep94 20:48:04 297 20:51:57 11 22 20:55:50 80 64 03:22:25:09
13Sep94 22:20:52 300 22:25:03 35 71 22:29:05 116 65 03:23:57:57
13Sep94 23:54:01 287 23:57:24 231 13 00:00:00 176 66 04:01:31:06

Paris France

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 00:08:58 303 00:13:09 227 60 00:17:21 134 18 01:01:46:03
11Sep94 16:20:06 170 16:23:05 123 6 16:25:47 82 29 01:17:57:11
11Sep94 17:51:24 229 17:55:18 150 72 17:59:29 56 30 01:19:28:29
11Sep94 19:24:30 273 19:28:24 341 18 19:32:17 50 31 01:21:01:35
11Sep94 20:58:30 303 21:02:05 5 12 21:05:41 64 32 01:22:35:35
11Sep94 22:31:36 310 22:35:29 22 24 22:39:22 96 33 02:00:08:41
12Sep94 00:04:24 300 00:08:17 232 35 00:12:28 144 34 02:01:41:29
12Sep94 16:14:38 183 16:17:55 130 10 16:21:13 75 45 02:17:51:43
12Sep94 17:46:32 239 17:50:25 317 69 17:54:37 54 46 02:19:23:37
12Sep94 19:19:56 280 19:23:49 350 15 19:27:25 51 47 02:20:57:01
12Sep94 20:53:38 305 20:57:13 5 12 21:00:48 67 48 02:22:30:43
12Sep94 22:26:44 309 22:30:37 22 31 22:34:48 105 49 03:00:03:49
12Sep94 23:59:32 296 00:03:25 227 22 00:07:18 154 50 03:01:36:37
13Sep94 16:09:22 194 16:12:57 129 15 16:16:32 68 61 03:17:46:27
13Sep94 17:41:34 248 17:45:27 327 43 17:49:38 52 62 03:19:18:39
13Sep94 19:15:16 288 19:18:51 351 13 19:22:26 52 63 03:20:52:21
13Sep94 20:48:39 307 20:52:15 6 13 20:56:08 74 64 03:22:25:44
13Sep94 22:21:45 308 22:25:39 25 44 22:29:39 113 65 03:23:58:50
13Sep94 23:54:38 292 00:00:00 186 9 00:00:00 186 66 04:01:31:43

Sydney Australia

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 02:27:07 197 02:30:42 137 11 02:34:00 81 19 01:04:04:12
11Sep94 03:59:37 235 04:03:30 303 19 04:07:24 13 20 01:05:36:42
11Sep94 18:30:46 326 18:34:40 27 69 18:38:51 139 30 01:20:07:51
12Sep94 02:22:14 203 02:26:08 130 18 02:29:43 67 35 02:03:59:19
12Sep94 03:55:20 246 03:58:38 301 10 04:01:55 357 36 02:05:32:25

12Sep94 18:26:00 313 18:29:53 229 49 18:34:04 146 46 02:20:03:05
13Sep94 02:17:16 210 02:21:09 131 32 02:25:02 54 51 03:03:54:21
13Sep94 03:50:58 258 03:53:39 300 5 03:56:21 341 52 03:05:28:03
13Sep94 16:49:25 12 16:52:25 61 7 16:55:24 108 61 03:18:26:30
13Sep94 18:21:01 300 18:24:55 226 25 18:28:48 153 62 03:19:58:06

Tokyo Japan

Satellite STS-64
Element Set 13

Date Rise Az Maximum Az El Set Az Orb Rise MET
11Sep94 07:18:22 204 07:22:15 132 33 07:26:26 49 23 01:08:55:27
11Sep94 08:52:04 269 08:55:21 322 8 08:58:39 15 24 01:10:29:09
11Sep94 15:08:56 334 15:12:49 42 18 15:16:43 112 28 01:16:46:01
11Sep94 16:42:02 297 16:45:37 235 12 16:48:55 179 29 01:18:19:07
12Sep94 07:13:35 217 07:17:29 142 76 07:21:40 42 39 02:08:50:40
12Sep94 08:47:53 282 08:50:35 323 5 08:53:34 8 40 02:10:24:58
12Sep94 15:03:58 328 15:08:09 51 31 15:12:02 124 44 02:16:41:03
12Sep94 16:37:39 285 16:40:39 238 6 16:43:20 196 45 02:18:14:44
13Sep94 07:08:37 229 07:12:30 306 47 07:16:41 35 55 03:08:45:42
13Sep94 14:58:59 322 15:03:10 68 64 15:07:04 136 60 03:16:36:04

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

1397. WX Sats

Newsgroup: rec.radio.amateur.space
Date: 1994-09-11 14:00:29 UTC
From: eddie.manalo@scninet.org
Message-ID: <94091122585869@scninet.org>
Source record: 27001

Can anyone please direct me where I can get informations about receiving
weather satellites?

Thanks!

Eddie Manalo
evmanalo@scninet.org [INTERNET] DU1UJ@DU1UJ.#SCAN.PHL.OC [PACKET]
76646,54 [COMPUSERVE] du1uj@du1uj.ampr.org [44.146.1.1] [AMPRNET]
(632) 921-3217 [FAX] P.O.Box 68 UP Diliman Quezon City 1101 [RPSnail]

1398. SAREX Keps 9/11 at 16:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-11 16:32:07 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.008.1994@ampr.org>
Source record: 27002
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.008
SAREX Keps 9/11 at 16:30 UTC

Silver Spring, MD September 11, 1994 at 16:30 UTC

Gil Carman, WA5NOM, reports that Element Set JSC-013 is still within 2 seconds of the current orbiter state vector. Since an orbit burn was planned this morning, a new set will probably be provided later today. Therefore, element set JSC-013 is considered the official SAREX set at this time. It is provided below for those who do not have it.

STS-64
1 23251U 94059A 94253.61508163 .00083204 00000-0 14200-3 0 137
2 23251 57.0087 221.4445 0009356 272.6550 87.3481 16.05232506 128

Satellite: STS-64
Catalog number: 23251
Epoch time: 94253.61508163 = (10 SEP 94 14:45:43.05 UTC)
Element set: 013
Inclination: 57.0087 deg
RA of node: 221.4445 deg Space Shuttle Flight STS-64
Eccentricity: .0009356 Keplerian element set JSC-013
Arg of perigee: 272.6550 deg from NASA flight Day 2 vector
Mean anomaly: 87.3481 deg
Mean motion: 16.05232506 rev/day Gil Carman
Decay rate: 8.3204e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 12
Checksum: 268

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1399. ANS-253 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-09-11 18:59:40 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-253.01.1994@ampr.org>
Source record: 27003
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-253.01
AO-16 FILE SERVER S/W RELOAD

HR AMSAT NEWS SERVICE BULLETIN 253.01 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 10, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-253.01

AO-16 Command Team To Reload File Server

At 03:00 UTC 12-SEP-1994 the AO-16 Command Team will begin a reload of the Ramdisk and File Server software. This "Preventive Maintenance" is warranted by the accumulation of uncorrectable SEU's (Single Event Upsets) in the file control structures stored on the ram disk. During the past year four uncorrectable SEU's have been recorded in the directory, root directory and FAT (File Allocation Table) entries of the error logs. In the past, a crash of the file server software was attributed to these types of errors. Reloading and running the ram disk software will reformat the ram disk thereby cleaning out all the bad SEU's. Fortunately, these uncorrectable errors are not occurring in the Error Detection And Correction (EDAC) memory where the actual spacecraft operational software is run. This allows the command team to unload and reload a task or tasks with the shortest amount of file server downtime. The digipeater will be off during this reload and all stations are requested not to uplink to the satellite during this time. The AO-16 Command Team would like to thank all AO-16 users in advance for your cooperation during this critical software reloading process.

[The AMSAT News Service (ANS) would like to thank Russ Platt (WJ9F) for this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-246.02
AO-10 STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 253.02 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 10, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-253.02

AO-10 Condition

Several satellite operators have asked recently about the condition of AMSAT-OSCAR-10 (AO-10).

Jim Kelly (KK3K) provides the information that he heard a strong telemetry beacon Tuesday morning 6-SEP-94 at about 12:00 UTC. It was at about 145.980 MHz and FMing. Jim notes that AO-10 was in the window at the time. He tried transmitting to it and was able to hear himself through the bird, but the downlink signal was extremely weak and FMing was quite noticeable. As a result, Jim discontinued using it immediately.

It should be noted that AO-10's Engineering Beacon is on a nominal frequency of 145.987 MHz. AMSAT-NA advises anyone hearing AO-10 exhibiting this FMing characteristic, to refrain from using it, as Jim did. This is a measure to conserve the satellite's power system. AO-10 may be old and ailing but it's still usable at times. Let's keep it going as long as we can.

/EX
SB SAT @ AMSAT $ANS-253.03
FINAL NOTICE FOR AMSAT-NA SYMPOSIUM

HR AMSAT NEWS SERVICE BULLETIN 253.03 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 10, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-253.03

Last Chance to Pre-register for the 1994 AMSAT Annual Meeting and Space Symposium

Martha Saragovitz (NOCALL) at AMSAT Headquarters reminds us that time is running short to pre-register for the AMSAT-NA Annual Meeting and Space symposium to be held in Orlando, Florida October 7,8 and 9. To meet the deadline, pre-registrations must be received at the AMSAT office by September 15th. Registrations can be FAXed to: (301) 608-3410.

Anyone needing further information may call the AMSAT office at: (301) 589-6062. A registration form is page 14 of the July/August 1994 issue of The AMSAT Journal.

/EX
SB SAT @ AMSAT $ANS-253.04
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 253.04 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 10, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-253.04

Weekly OSCAR Status Reports: 10-SEP-94

AO-13: Current Transponder Operating Schedule:
M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Jul 11 - Sep 12
Mode-B : MA 0 to MA 90 | Omnis : MA 230 to MA 30
Mode-BS : MA 90 to MA 120 |
Mode-S : MA 120 to MA 122 |<- S beacon only
Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF
Mode-S : MA 145 to MA 150 |<- S beacon only

Mode-BS : MA 150 to MA 180 | Blon/Blat 180/0
Mode-B : MA 180 to MA 256 | Move to attitude 230/0, Sep 12
==========
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
==========
[G3RUH/DB2OS/VK5AGR]

FO-20: The long awaited software reloading of FO-20 has completed successfully completed on a pass at about 18:00 UTC on 06-SEP-94 and FO-20 was commanded into its digital mode of operation (Mode-JD). For a while, Mode-JD operation will be continued. However, the FO-20 ground station is concerned that the system may crash when mailbox is activated. The controllers have have noticed some failures of onboard command system during the reloading process. Telemetry reports will be very much apprec-iated if you capture it just before the any crashes. Send your telemetry to Kazu Sakamoto (JJ1WTK) at his INTERNET address of qga02014@niftyserve.or.jp. But in a further status report, KD2BD reports that FO-20 mailbox came back to life over the Labor Day weekend. KD2BD notes that the satellite was sending it's usual ASCII telemetry in AX.25, BPSK, 1200 bps format, and the mailbox was in operation with several active messages. [JJ1WTK & KD2BD]

AO-27: AO-27 has an Uplink frequency of 145.85 MHz FM and Downlink frequency of 436.80 MHz FM. N9AVG reminds everyone that like AO-21, AO-27 operates as part-time repeater. [N9AVG]

IO-26: ITAMSAT Status as of 9-SEP-94: After 40 days of stand-by, ITAMSAT was switched on by ground command and a full spacecraft checkout was performed by the control team. IO-26 was in excellent shape, the battery fully charged and the critical parameters in nominal status. A couple of test software were loaded and executed without any problem. The reason for the long silence is due to the heavy workload of the control team (I2KBD also spent some time in Chile to help the CESAR team) and a lightning that destroyed the main command station. The reload of the Integrated House-keeping Task (IHT) code with improved capabilities is scheduled to be completed by the end of September to celebrate the first year in orbit of IO-26, so expect a couple more weeks of discontinued use. Best regards, Alberto (I2KBD) ITAMSAT Mission Director. [I2KBD]

KO-25: WH6I reports that KO-25 has still been operational this entire week as far as he can tell. [WH6I]

KO-23: WH6I reports that KO-23 is up and running. He wonders if there is a flaw in the directory as he seem to be having a lot of trouble clearing fills for the directory. [WH6I]

AO-16: AO-16 is up and running without any problems. [WH6I]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1400. STS-64 Checkpoint #1

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 00:40:07 UTC
From: tstader@aol.com
Message-ID: <350817$hct@search01.news.aol.com>
Source record: 27004

MacSPOC Users-

The enclosed checkpoint reflects tracking following the second and final trim burn performed by Discovery's crew Friday night CDT. A third trim burn scheduled for 1/04:15 MET is not required as of this posting.

-Dan Adamo

==========
File: STS64-1.cp (488 bytes)
==========
Orbit 4 Post-Trim-2 Burn at 0.05:10 MET
1994 252 (9- 9) 22 22 54.947
1994 253 (9-10) 4 40 .000
0.244960569513D+07 0.102961438822D+01
3 5
0.767971829183D+07 -0.905781181423D+07 0.182521454385D+08
0.187300303650D+05 0.171637253156D+05 0.636055325202D+03
2004.1 230606.9 79.00 2.72

1401. STS-64 Checkpoint #2

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 00:42:03 UTC
From: tstader@aol.com
Message-ID: <35084r$he3@search01.news.aol.com>
Source record: 27005

MacSPOC Users-

The enclosed checkpoint reflects tracking following Trim Burn #3, a 0.6 fps retrograde refinement of Discovery's orbit at 1/04:15 MET. It corrects 12.5 miles of downtrack error accumulated since the last update. The 3 trim burns performed Friday and Saturday are targeting a LITE pass over EDW at 1/10:48 MET required to be at 85 degrees maximum elevation. A fourth trim targeting LITE's pass over NOR at 4/09:02 MET is under evaluation for execution at 1/17:02 MET.

-Dan Adamo

==========
STS64-2.cp (488 bytes)
==========
Orbit 19 Post-Trim-3 Burn at 1/04:15 MET
1994 252 (9- 9) 22 22 54.947
1994 254 (9-11) 4 10 .000
0.244960667430D+07 0.915559108764D+00
3 20
-0.180814167715D+08 -0.116285560623D+08 -0.349732216452D+07
0.471738106021D+04 -0.136386202327D+05 0.209407797499D+05
638.5 230054.4 79.00 2.72

1402. STS-64 Checkpoint #3

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 02:20:04 UTC
From: tstader@aol.com
Message-ID: <350dsk$j1u@search01.news.aol.com>
Source record: 27006

MacSPOC Users-

The enclosed checkpoint reflects tracking following a 2 fps posigrade Trim Burn #4 executed at 1/17:02:43 MET. Allowing for the trim burn's effects, this checkpoint removes 9.1 miles of downtrack error accumulated since the last update. The next Trim Burn #5 opportunity at 3/16:51 MET is currently being evaluated.

-Dan Adamo

```
================
STS64-3.cp
================
Orbit 32 Post-Trim-#4 at 1/22:23 MET
1994 252 ( 9- 9) 22 22 54.947
1994 255 ( 9-12) 1 0 .000
0.244960754235D+07 0.101460755499D+00
3 34
-0.187222543734D+08 -0.517970160057D+07 -0.985672721201D+07
-0.465036743151D+04 -0.173911884863D+05 0.179518363115D+05
1800.2 229431.0 79.00 2.72
```

1403. STS-64 Element Set (94254.860)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 05:15:59 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94254.860@alsys.com>
Source record: 26863
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94254.86048025 .00093663 00000-0 13247-3 0 142
2 23251 57.0063 215.5674 0009507 266.7470 93.2542 16.05080819 327

Satellite: STS-64
Catalog number: 23251
Epoch time: 94254.86048025 = (11 SEP 94 20:39:05.49 UTC)
Element set: 014
Inclination: 57.0063 deg
RA of node: 215.5674 deg Space Shuttle Flight STS-64
Eccentricity: .0009507 Keplerian element set JSC-014
Arg of perigee: 266.7470 deg from NASA flight Day 3 vector
Mean anomaly: 93.2542 deg
Mean motion: 16.05080819 rev/day Gil Carman
Decay rate: 9.3663e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 32

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1404. SAREX Status/Keps 9/12 at 11:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 11:13:33 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.009.1994@ampr.org>
Source record: 27007
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.009
SAREX Status/Keps 9/12 at 11:00 UTC

Silver Spring, MD September 12, 1994 at 11:00 UTC

The SAREX station on the Space Shuttle Discovery was set up by Commander Dick Richards, KB5SIW, and checked out during an Australian pass with Graham Ratcliff, VK5AGR on 9/10 at 20:05 UTC. Since that time, 7 of the 10 the SAREX school groups have successfully completed their scheduled contacts with the shuttle astronauts and several radio amateurs on the ground have had general voice QSOs with the Shuttle Crew.

Several of the school groups have had spectacular horizon-to-horizon contacts with the astronauts with up to 23 questions answered. A total of four schools completed their contacts with the astronauts on 9/10 and three more talked to the crew on 9/11. The first school contact was with the Eisenhower Middle School in Laurel, Maryland on 9/10 at 22:23 UTC. The Goddard ARC, headed by Jim Gass, N3CJN, supported this contact. 11 students asked 22 questions with sufficient time left over for the contact coordinator and teacher to say a few words and ask a question. Rookie astronaut Jerry Linenger, KB5HBR, was at the mike for this contact and was heard to exclaim "Go Navy!!" when he heard that the teacher was heading for the Navy/Virgina football game right after the contact. The Eisenhower contact was quickly followed by a successful contact with students at the Francis Howell Middle School in St. Charles, Missouri and Shuttle Commander Dick Richards, KB5SIW. Ten students were able to ask questions and get responses from Dick during the 7.5 minute contact window. AMSAT people supporting this contact in Missouri included Rusty Baum, WB0QJB, Mike Koenig, Roy Welch, W0SL. Less than one orbit later, the Middleton Grange Middle School in New Zealand had an outstanding contact with Linenger, KB5HBR. 18 questions were answered. The event was covered by all the New Zealand national television services and was retransmitted throughout the country on VHF and on HF. Other school group contacts which have been successfully completed included the Grizzly Hill school in North San Juan, California, the Central Square Middle School in Central Square, New York, the Crystal Lake South Elementary in Crystal Lake, Illinois and the Morocco Elementary School in Morocco, Indiana.

The official Keplerian element set for today is JSC-014 This set, developed by Gil Carman, WA5NOM, at the Johnson Space Center, is provided below.

STS-64
1 23251U 94059A 94254.86048025 .00093663 00000-0 13247-3 0 142

2 23251 57.0063 215.5674 0009507 266.7470 93.2542 16.05080819 327

Satellite: STS-64
Catalog number: 23251
Epoch time: 94254.86048025 = (11 SEP 94 20:39:05.49 UTC)
Element set: 014
Inclination: 57.0063 deg
RA of node: 215.5674 deg Space Shuttle Flight STS-64
Eccentricity: .0009507 Keplerian element set JSC-014
Arg of perigee: 266.7470 deg from NASA flight Day 3 vector
Mean anomaly: 93.2542 deg
Mean motion: 16.05080819 rev/day Gil Carman
Decay rate: 9.3663e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 32
Checksum: 292

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

1405. Re: DSS Mail Order Outlets

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 12:09:49 UTC
From: anderson@kosepc01.delcoelect.com
Message-ID: <1994Sep12.120949.5296@kocrsv01.delcoelect.com>
Source record: 27008

In <1055DKNVPLCLEVSEYF@slacc.com>, sraike@slacc.com writes:
>
>Does anyone know of a mail order outlet with RCA DSS systems in stock?

As of a couple of months ago, mail-order DSS was not authorized by RCA.
They're apparently trying to discourage people outside the "trial areas"
from trying it prematurely. You can travel to a distributor in a trial
area and buy one in person, however.

==========
Alan Anderson || Ignorance can be fixed, but stupidity is permanent.
I speak AT, not FOR, Delco Electronics. || Ad Astra! (Ad LEO, anyway...)

1406. Re: WX Sats

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 13:12:33 UTC
From: mklee@actrix.gen.nz
Message-ID: <Cw0q0y.CD4@actrix.gen.nz>
Source record: 27010

In article <94091122585869@scninet.org>,
Eddie Manalo <eddie.manalo@scninet.org> wrote:
> Can anyone please direct me where I can get informations about receiving
> weather satellites?

Have you tried the book "Weather Satellite Handbook" by Dr Ralph E
Taggart (WB8DQT), 4th edition, published by ARRL. Costs USD20, I believe.

I found it very good for general understanding of what could be obtained
and what to expect.

Regards
mklee@actrix.gen.nz
Mun-Kong Lee
Raumati Beach
New Zealand

1407. STS-64 Orbital State Vector Rev #41

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 14:06:05 UTC
From: astroman@netcom.com
Message-ID: <astromanCw0sI5.EFx@netcom.com>
Source record: 27009
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94255.46059625000
09/12/1994 11:03:15.516 UTC
EFG E: -659898.46 ft
F: -16854623.36 ft
G: -13777169.42 ft
Edot: 17080.5324 ft/s
Fdot: 10779.1328 ft/s
Gdot: -13993.3736 ft/s
ndot/2 (drag): 0.00095893249 rev/day^2
nddt/6: 3.81885E-08 rev/day^3
Bstar: 1.34087E-04 1/Earth Radii
Elset #: 7
Rev @ Epoch: 41.63609547862
.....................................................................

The drag values are estimated by VEC2TLE using a 1.35 drag multiplier.

The next scheduled orbit adjust is Trim Burn 5 (followed shortly by Trim
Burn 6). Trim Burn 5 is scheduled to occur at an MET of 03/16:51:00 which
occurs at approximately 13-Sep-94 / 15:13:55 UTC.

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1408. MIR Info

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 15:28:29 UTC
From: lisansky@strauss.udel.edu
Message-ID: <351s2t$hs8@strauss.udel.edu>
Source record: 26861

Mir is simplex on 145.55. The problem with a verticle is there is little
or no signal radiated up. That's what makes a good verticle, a pattern to
the horizon. So here's the catch 22. Your signal is best on the horizon
when MIR is farthest away, and worse when MIR is closest (when straight
overhead). You need to know when MIR comes over the horizon, and try
then. I run Traksat with the Keps updated every time I see new ones.
The MIR orbit changes. I note the time it comes up and sit and wait.
When I hear their signal, I am ready for either packet or voice. When it
gets close to being overhead, I loose them. When they pass, I pick them
up again.
I have to mention this because I see alot of people doing it.
When you see MIR on your screen and they're connected to someone else, DO
NOT try to connect. They can only do one connect at a time, and you'll
only be adding to the QRM. If you interfear with the connected station,
it will take longer for them to do their thing and dissconnect. Most of
the time this means you'll have to wait for them to "time out" with MIR.
By then they'll be gone. Wait untill you see the disconnect message, then
try. We would all get much better results using this method.
Terry

--
Terry Lisansky (lisansky@strauss.udel.edu)
Give me a fast ship.....
For I intend to go in harms way.

1409. Re: SAREX Status/Keps 9/12 at 11:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 20:33:48 UTC
From: philb@teleport.com
Message-ID: <352dvc$ckg@sandra.teleport.com>
Source record: 26864
Cross-posted to: rec.radio.amateur.space,sci.space

I'm a little new at this. I've been listening for STS-64 for several days now and have heard absolutely nothing. My tracking program seems to be working ok as it agrees with the display I see from NASA Select. I'm listening on 145.55 and xmitting packet on 144.49. I'm using a Isopole or a KLM sat crossed yagi with a Yaesu FT-736. I don't hear a peep on either the the packet radio or the Yaesu. I adjust the vfo upwards to compensate for oncoming doppler and manually adjust the yagi to track the shuttle. I leave computer on listening on 145.55 and not a single packet sqeak is heard.

Any ideas?

Thanks,
Phil, N7FWL
--
philb@teleport.com Public Access User --- Not affiliated with TECHbooks
Public Access UNIX and Internet at (503) 220-0704 (2400-14400/9600/14400 N81)

1410. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 23:21:55 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779412115@afit.af.mil>
Source record: 26872
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 64
1 23251U 94059A 94254.91666667 .00002090 10680-4 76755-5 0 100
2 23251 57.0034 215.3048 0009237 262.9265 61.8425 16.05106941 313
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1411. STS-64 Orbital State Vector Rev #46

Newsgroup: rec.radio.amateur.space
Date: 1994-09-12 23:31:54 UTC
From: astroman@netcom.com
Message-ID: <astromanCw1Ip6.993@netcom.com>
Source record: 26862
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 7
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94255.75008328704
09/12/1994 18:00:07.196 UTC
ECI X: 3055.261376 km
Y: -2273.440411 km
Z: 5436.176000 km
Xdot: 5.988102584 km/s
Ydot: 4.711679502 km/s
Zdot: -1.393765000 km/s
ndot/2 (drag): 0.00099631029 rev/day^2
nddt/6: 4.12223E-08 rev/day^3
Bstar: 1.38809E-04 1/Earth Radii
Elset #: 8
Rev @ Epoch: 46.28439684860

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1412. MIR INFO REQUESTED

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 05:03:00 UTC
From: mike.scheel@slc.davenport.ia.us
Message-ID: <29a.21.2033@slc.davenport.ia.us>
Source record: 26896

Bob Stanton said this about: MIR INFO REQUESTED

BS> I have been trying to contact the packet radio station on board
> the MIR space station. Can someone tell me if and what I am doing
> wrong? Lets start with my hardware:

BS> I am transmitting on 144.49 and receiving on 145.55. I am
> listening for and attempting to connect to R8MIR-1.

Transmit and receive 145.550 only. Mir doesn't use a split.

Michael W. Scheel RCMA IA-011
N0NGL [EN41RN] N0NGL@W0BXR.IA.US.NA
INTERNET:mike.scheel@slc.davenport.ia.us

* 1st 2.00b #408 * You are listening to the mighty WKRP in Cinncinati.
--- Silver Xpress Mail System 5.03H1

Internet: mike.scheel@slc.davenport.ia.us (Mike Scheel)
This message was processed by RAuucp from Merlin Systems Inc.

1413. Rise Set Times 9/14-16

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 12:32:01 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.010.1994@ampr.org>
Source record: 26881
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SB SAREX @ AMSAT $STS-64.010
STS-64 Eastern R/S Times 09/14

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Atlanta GA

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:57:10 321 06:01:03 304 83 06:05:15 142 70 04:07:34:15
14Sep94 20:28:31 189 20:32:06 127 17 20:35:59 57 80 04:22:05:36
14Sep94 22:01:37 258 22:04:54 315 12 22:08:30 17 81 04:23:38:42
15Sep94 04:20:01 351 04:23:00 37 7 04:26:00 86 85 05:05:57:06
15Sep94 05:52:14 313 05:56:07 234 37 06:00:00 155 86 05:07:29:19
15Sep94 20:23:10 202 20:27:03 126 32 20:30:56 49 96 05:22:00:15
15Sep94 21:56:52 270 22:00:10 323 7 22:03:09 10 97 05:23:33:57
16Sep94 04:14:40 344 04:17:58 39 11 04:21:33 101 101 06:05:51:45
16Sep94 05:47:11 304 05:50:46 242 19 05:54:40 168 102 06:07:24:16
16Sep94 20:17:49 215 20:21:43 149 73 20:25:54 41 112 06:21:54:54

Miami FL

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:59:10 330 06:03:21 65 50 06:07:14 138 70 04:07:36:15
14Sep94 20:27:13 218 20:31:06 318 70 20:34:59 33 80 04:22:04:18
15Sep94 05:54:13 321 05:58:24 213 58 06:02:18 151 86 05:07:31:18
15Sep94 20:21:58 230 20:25:51 301 28 20:30:03 24 96 05:21:59:03
16Sep94 04:17:16 2 04:20:15 48 5 04:22:57 90 101 06:05:54:21
16Sep94 05:49:10 311 05:53:04 238 25 05:56:57 165 102 06:07:26:15
16Sep94 18:45:01 170 18:48:18 116 8 18:51:18 68 111 06:20:22:06
16Sep94 20:17:13 245 20:20:49 311 15 20:24:24 14 112 06:21:54:18

New York NY

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 02:52:21 344 02:55:03 26 5 02:57:44 67 68 04:04:29:26
14Sep94 04:24:16 321 04:28:27 46 43 04:32:20 125 69 04:06:01:21
14Sep94 05:57:58 284 06:00:58 237 7 06:03:57 190 70 04:07:35:03
14Sep94 20:31:00 205 20:34:53 130 30 20:38:47 54 80 04:22:08:05
14Sep94 22:04:25 266 22:08:00 330 13 22:11:35 28 81 04:23:41:30
15Sep94 02:47:01 338 02:50:19 30 7 02:53:18 77 84 05:04:24:06
15Sep94 04:19:32 316 04:23:25 356 84 04:27:36 136 85 05:05:56:37
15Sep94 20:25:46 217 20:29:40 153 58 20:33:51 48 96 05:22:02:51
15Sep94 21:59:29 274 22:02:46 326 9 22:06:21 25 97 05:23:36:34
16Sep94 02:41:47 335 02:45:23 35 10 02:48:40 88 100 06:04:18:52
16Sep94 04:14:18 310 04:18:11 241 45 04:22:23 147 101 06:05:51:23
16Sep94 20:20:26 228 20:24:38 335 66 20:28:31 42 112 06:21:57:31
16Sep94 21:54:45 285 21:57:44 331 6 22:00:43 19 113 06:23:31:50

Washington DC

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 04:24:28 330 04:28:21 43 21 04:32:14 112 69 04:06:01:33
14Sep94 05:57:34 295 06:00:52 239 12 06:04:27 176 70 04:07:34:39
14Sep94 20:30:18 201 20:34:11 126 25 20:38:05 54 80 04:22:07:23
14Sep94 22:03:25 262 22:07:00 321 12 22:10:35 24 81 04:23:40:30
15Sep94 04:19:20 324 04:23:31 53 35 04:27:24 124 85 05:05:56:25
15Sep94 05:52:44 288 05:55:43 242 7 05:58:43 192 86 05:07:29:49
15Sep94 20:25:10 213 20:29:03 129 50 20:32:56 48 96 05:22:02:15
15Sep94 21:58:52 274 22:02:10 328 8 22:05:27 20 97 05:23:35:57
16Sep94 02:42:10 346 02:44:52 27 5 02:47:51 74 100 06:04:19:15
16Sep94 04:14:05 319 04:18:16 48 72 04:22:10 135 101 06:05:51:10
16Sep94 20:19:44 224 20:23:55 356 70 20:27:48 42 112 06:21:56:49
16Sep94 21:54:20 288 21:57:01 330 6 22:00:01 16 113 06:23:31:25

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

SB SAREX @ AMSAT $STS-64.011
STS-64 Central R/S Times 09/14

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.

Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Chicago IL

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 04:22:28 330 04:26:04 31 13 04:29:39 94 69 04:05:59:33
14Sep94 05:54:59 307 05:59:10 224 34 06:03:03 152 70 04:07:32:04
14Sep94 22:02:01 227 22:05:54 291 76 22:10:06 45 81 04:23:39:06
14Sep94 23:36:01 283 23:39:19 336 8 23:42:18 24 82 05:01:13:06
15Sep94 04:17:26 327 04:21:20 38 18 04:24:55 104 85 05:05:54:31
15Sep94 05:50:15 301 05:54:08 229 19 05:57:43 164 86 05:07:27:20
15Sep94 20:25:22 173 20:28:22 124 8 20:31:39 72 96 05:22:02:27
15Sep94 21:56:59 238 22:00:52 317 40 22:05:03 40 97 05:23:34:04
15Sep94 23:31:35 294 23:34:17 337 6 23:37:16 23 98 06:01:08:40
16Sep94 04:12:06 322 04:16:17 44 28 04:20:11 115 101 06:05:49:11
16Sep94 05:45:13 294 05:48:48 235 12 05:52:05 178 102 06:07:22:18
16Sep94 20:19:26 188 20:23:02 126 13 20:26:37 64 112 06:21:56:31
16Sep94 21:51:57 249 21:55:50 329 24 21:59:43 36 113 06:23:29:02

Denver CO

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:53:23 333 05:56:58 36 14 06:00:34 100 70 04:07:30:28
14Sep94 07:25:54 304 07:29:47 236 22 07:33:40 162 71 04:09:02:59
14Sep94 22:00:07 181 22:03:25 124 12 22:07:00 64 81 04:23:37:12
14Sep94 23:32:20 247 23:35:55 314 23 23:39:48 32 82 05:01:09:25
15Sep94 05:48:15 328 05:52:08 41 22 05:56:01 112 86 05:07:25:20
15Sep94 07:21:21 295 07:24:39 239 13 07:28:14 175 87 05:08:58:26
15Sep94 21:54:23 196 21:58:16 124 20 22:01:52 58 97 05:23:31:28
15Sep94 23:27:30 258 23:31:05 325 15 23:34:40 28 98 06:01:04:35
16Sep94 05:43:07 324 05:47:00 42 36 05:50:53 123 102 06:07:20:12
16Sep94 07:16:31 286 07:19:30 238 7 07:22:30 190 103 06:08:53:36
16Sep94 21:48:57 208 21:52:50 133 36 21:56:43 51 113 06:23:26:02
16Sep94 23:22:21 268 23:25:57 328 10 23:29:21 24 114 07:00:59:26

Houston TX

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:57:04 352 06:00:21 47 9 06:03:39 100 70 04:07:34:09
14Sep94 07:29:17 306 07:33:10 236 18 07:36:45 171 71 04:09:06:22
14Sep94 21:58:49 234 22:02:43 317 28 22:06:36 26 81 04:23:35:54

15Sep94 05:51:43 343 05:55:19 45 15 05:58:54 112 86 05:07:28:48
15Sep94 07:24:50 294 07:28:07 238 9 07:31:25 185 87 05:09:01:55
15Sep94 20:21:34 175 20:24:51 121 10 20:28:09 66 96 05:21:58:39
15Sep94 21:53:47 246 21:57:40 317 15 22:01:15 18 97 05:23:30:52
16Sep94 05:46:23 334 05:50:16 49 28 05:54:09 126 102 06:07:23:28
16Sep94 20:15:56 189 20:19:31 124 18 20:23:24 54 112 06:21:53:01
16Sep94 21:49:02 260 21:52:19 314 9 21:55:37 9 113 06:23:26:07

Huntsville AL

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:56:34 322 06:00:45 84 69 06:04:39 138 70 04:07:33:39
14Sep94 20:28:48 179 20:32:06 124 11 20:35:41 64 80 04:22:05:53
14Sep94 22:01:01 247 22:04:54 319 18 22:08:30 23 81 04:23:38:06
15Sep94 04:19:43 352 04:22:25 34 6 04:25:24 83 85 05:05:56:48
15Sep94 05:51:38 315 05:55:31 246 47 05:59:42 150 86 05:07:28:43
15Sep94 20:23:10 194 20:27:03 122 20 20:30:38 56 96 05:22:00:15
15Sep94 21:56:16 260 21:59:52 320 11 22:03:27 18 97 05:23:33:21
16Sep94 04:14:05 344 04:17:40 43 10 04:20:57 97 101 06:05:51:10
16Sep94 05:46:35 307 05:50:28 234 23 05:54:22 163 102 06:07:23:40
16Sep94 20:17:49 206 20:21:43 125 39 20:25:36 47 112 06:21:54:54
16Sep94 21:51:50 275 21:54:49 324 7 21:57:48 11 113 06:23:28:55

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/EX

SB SAREX @ AMSAT $STS-64.012
STS-64 Western R/S Times 09/14

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Albuquerque NM

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:54:29 351 05:57:28 37 5 06:00:10 79 70 04:07:31:34

14Sep94 07:26:41 317 07:30:35 233 61 07:34:28 147 71 04:09:03:46
14Sep94 21:58:31 188 22:02:07 126 15 22:06:00 58 81 04:23:35:36
14Sep94 23:31:20 254 23:34:55 316 14 23:38:30 20 82 05:01:08:25
15Sep94 05:49:26 346 05:52:43 42 9 05:56:01 94 86 05:07:26:31
15Sep94 07:21:39 309 07:25:32 236 28 07:29:25 160 87 05:08:58:44
15Sep94 21:53:11 201 21:57:04 124 29 22:00:57 50 97 05:23:30:16
15Sep94 23:26:53 269 23:29:53 318 8 23:33:10 13 98 06:01:03:58
16Sep94 05:44:05 340 05:47:41 46 14 05:51:16 106 102 06:07:21:10
16Sep94 07:16:36 301 07:20:11 241 15 07:23:47 174 103 06:08:53:41
16Sep94 21:47:50 214 21:51:43 131 63 21:55:37 43 113 06:23:24:55
16Sep94 23:22:08 282 23:24:50 323 5 23:27:28 5 114 07:00:59:13

Honolulu HI

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 00:59:13 183 01:02:48 120 14 01:06:23 57 67 04:02:36:18
14Sep94 02:32:37 261 02:35:37 310 7 02:38:36 358 68 04:04:09:42
14Sep94 10:28:49 4 10:31:48 50 6 10:34:47 96 73 04:12:05:54
14Sep94 12:01:01 306 12:04:37 240 18 12:08:12 173 74 04:13:38:06
15Sep94 00:53:52 198 00:57:45 125 30 01:01:39 45 83 05:02:30:57
15Sep94 10:23:28 353 10:26:45 48 12 10:30:21 112 89 05:12:00:33
15Sep94 11:56:16 294 11:59:34 240 9 12:02:33 190 90 05:13:33:21
16Sep94 00:48:49 211 00:52:43 99 80 00:56:36 34 99 06:02:25:54
16Sep94 10:18:01 343 10:21:37 48 22 10:25:30 126 105 06:11:55:06

Los Angeles CA

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 01:08:29 281 01:11:10 324 5 01:13:52 5 67 04:02:45:34
14Sep94 07:25:23 338 07:28:59 39 16 07:32:52 111 71 04:09:02:28
14Sep94 08:58:12 298 09:01:47 239 12 09:05:22 178 72 04:10:35:17
14Sep94 23:28:56 224 23:33:08 322 61 23:37:01 36 82 05:01:06:01
15Sep94 07:20:15 331 07:24:08 44 28 07:28:02 123 87 05:08:57:20
15Sep94 08:53:57 284 08:56:39 241 6 08:59:38 194 88 05:10:31:02
15Sep94 21:52:47 163 21:55:29 120 6 21:58:28 74 97 05:23:29:52
15Sep94 23:24:06 236 23:27:59 313 29 23:31:53 29 98 06:01:01:11
16Sep94 07:15:07 324 07:19:00 40 58 07:23:11 136 103 06:08:52:12
16Sep94 21:46:45 179 21:50:03 124 11 21:53:38 63 113 06:23:23:50
16Sep94 23:18:58 248 23:22:51 318 17 23:26:34 23 114 07:00:56:03

Seattle WA

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 01:08:29 228 01:12:40 131 77 01:16:51 54 67 04:02:45:34

14Sep94 02:42:11 276 02:45:47 340 15 02:49:22 44 68 04:04:19:16
14Sep94 04:16:12 307 04:19:29 1 9 04:22:46 55 69 04:05:53:17
14Sep94 05:49:18 315 05:53:11 24 16 05:56:47 87 70 04:07:26:23
14Sep94 07:22:07 305 07:26:18 204 61 07:30:11 135 71 04:08:59:12
14Sep94 23:32:08 179 23:35:08 130 9 23:38:25 75 82 05:01:09:13
15Sep94 01:03:45 238 01:07:38 310 61 01:11:49 51 83 05:02:40:50
15Sep94 02:37:27 283 02:41:02 346 12 02:44:38 45 84 05:04:14:32
15Sep94 04:11:27 311 04:14:45 6 9 04:18:02 59 85 05:05:48:32
15Sep94 05:44:16 314 05:48:09 21 20 05:52:02 96 86 05:07:21:21
15Sep94 07:17:04 302 07:21:16 219 35 07:25:09 146 87 05:08:54:09
15Sep94 23:26:30 192 23:30:05 128 14 23:33:41 67 98 06:01:03:35
16Sep94 00:58:43 248 01:02:36 324 38 01:06:47 49 99 06:02:35:48
16Sep94 02:32:25 289 02:36:00 348 11 02:39:36 47 100 06:04:09:30
16Sep94 04:06:25 313 04:09:43 8 10 04:13:00 64 101 06:05:43:30
16Sep94 05:39:14 313 05:43:07 24 27 05:47:00 104 102 06:07:16:19
16Sep94 07:12:02 298 07:15:56 229 22 07:19:49 156 103 06:08:49:07
16Sep94 23:20:46 204 23:24:39 134 22 23:28:11 64 114 07:00:57:51

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/EX

SB SAREX @ AMSAT $STS-64.013
STS-64 World R/S Times 09/14

Below are the rise and set times for STS-64 for selected worldwide cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

London UK

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 00:00:00 186 00:00:00 186 7 00:01:48 166 66 04:01:37:05
14Sep94 16:05:08 194 16:08:44 132 13 16:12:19 73 77 04:17:42:13
14Sep94 17:37:03 243 17:41:14 334 72 17:45:25 60 78 04:19:14:08
14Sep94 19:10:27 280 19:14:21 350 22 19:18:14 64 79 04:20:47:32
14Sep94 20:43:52 299 20:47:45 14 24 20:51:38 86 80 04:22:20:57
14Sep94 22:16:40 299 22:20:51 184 73 22:24:45 125 81 04:23:53:45
14Sep94 23:50:05 280 23:53:04 232 8 23:56:21 179 82 05:01:27:10
15Sep94 15:59:42 204 16:03:35 135 18 16:07:11 70 93 05:17:36:47

15Sep94 17:32:13 251 17:36:06 324 49 17:40:17 59 94 05:19:09:18
15Sep94 19:05:37 285 19:09:30 359 20 19:13:24 67 95 05:20:42:42
15Sep94 20:38:44 300 20:42:37 10 28 20:46:48 93 96 05:22:15:49
15Sep94 22:11:32 298 22:15:43 210 47 22:19:36 134 97 05:23:48:37
15Sep94 23:45:14 274 23:47:56 233 5 23:50:37 192 98 06:01:22:19
16Sep94 15:54:22 214 15:58:15 140 27 16:02:09 66 109 06:17:31:27
16Sep94 17:27:11 259 17:31:04 342 37 17:34:57 59 110 06:19:04:16
16Sep94 19:00:35 290 19:04:10 355 20 19:08:04 69 111 06:20:37:40
16Sep94 20:33:41 301 20:37:35 22 34 20:41:28 99 112 06:22:10:46
16Sep94 22:06:30 295 22:10:23 217 30 22:14:13 143 113 06:23:43:35

Paris France

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 00:00:00 200 00:00:00 200 12 00:02:41 165 66 04:01:37:05
14Sep94 16:04:32 207 16:08:26 137 23 16:12:19 64 77 04:17:41:37
14Sep94 17:37:21 256 17:41:14 332 30 17:45:07 50 78 04:19:14:26
14Sep94 19:11:03 292 19:14:39 353 12 19:18:14 54 79 04:20:48:08
14Sep94 20:44:28 309 20:48:21 17 15 20:51:56 80 80 04:22:21:33
14Sep94 22:17:16 306 22:21:27 30 71 22:25:39 122 81 04:23:54:21
14Sep94 23:50:41 285 23:53:58 231 9 23:57:15 178 82 05:01:27:46
15Sep94 15:59:30 216 16:03:24 136 36 16:07:17 60 93 05:17:36:35
15Sep94 17:32:19 264 17:36:12 334 23 17:40:05 50 94 05:19:09:24
15Sep94 19:06:19 298 19:09:54 2 12 19:13:12 57 95 05:20:43:24
15Sep94 20:39:26 310 20:43:19 18 18 20:47:12 87 96 05:22:16:31
15Sep94 22:12:14 304 22:16:25 208 69 22:20:19 132 97 05:23:49:19
15Sep94 23:45:56 277 23:48:38 236 5 23:51:19 193 98 06:01:23:01
16Sep94 15:54:10 226 15:58:04 152 61 16:02:15 57 109 06:17:31:15
16Sep94 17:27:17 271 17:31:10 341 18 17:35:03 50 110 06:19:04:22
16Sep94 19:01:17 303 19:04:34 359 12 19:08:10 61 111 06:20:38:22
16Sep94 20:34:24 311 20:38:17 27 22 20:42:10 95 112 06:22:11:29
16Sep94 22:07:12 300 22:11:05 222 40 22:15:10 141 113 06:23:44:17

Sydney Australia

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 02:12:35 218 02:16:46 133 73 02:20:39 41 67 04:03:49:40
14Sep94 16:44:31 356 16:47:49 54 14 16:51:42 121 77 04:18:21:36
14Sep94 18:17:02 288 18:20:37 226 14 18:24:30 159 78 04:19:54:07
15Sep94 00:35:44 188 00:38:43 142 6 00:41:43 96 82 05:02:12:49
15Sep94 02:07:38 225 02:11:50 308 47 02:15:43 28 83 05:03:44:43
15Sep94 16:38:53 342 16:42:46 53 26 16:46:39 128 93 05:18:15:58
15Sep94 18:12:35 273 18:15:52 217 9 18:19:10 166 94 05:19:49:40
16Sep94 00:30:23 194 00:33:41 141 10 00:37:16 82 98 06:02:07:28
16Sep94 02:02:54 233 02:06:47 310 22 02:10:22 15 99 06:03:39:59
16Sep94 16:33:32 329 16:37:25 37 54 16:41:37 137 109 06:18:10:37

16Sep94 18:07:50 261 18:10:32 220 5 18:13:31 174 110 06:19:44:55

Tokyo Japan

Satellite STS-64
Element Set 14

Date Rise Az Maximum Az El Set Az Orb Rise MET
14Sep94 05:32:33 172 05:35:50 118 8 05:38:49 70 70 04:07:09:38
14Sep94 07:04:27 242 07:08:21 319 24 07:12:14 29 71 04:08:41:32
14Sep94 13:22:40 349 13:25:39 36 6 13:28:39 83 75 04:14:59:45
14Sep94 14:54:52 315 14:58:46 233 52 15:02:39 149 76 04:16:31:57
15Sep94 05:27:00 187 05:30:36 124 15 05:34:11 60 86 05:07:04:05
15Sep94 06:59:49 254 07:03:24 320 15 07:06:59 22 87 05:08:36:54
15Sep94 13:17:19 342 13:20:54 43 10 13:24:12 96 91 05:14:54:24
15Sep94 14:49:50 307 14:53:43 233 25 14:57:36 161 92 05:16:26:55
16Sep94 05:21:40 200 05:25:15 133 27 05:29:26 51 102 06:06:58:45
16Sep94 06:55:04 267 06:58:21 322 9 07:01:39 16 103 06:08:32:09
16Sep94 13:11:58 337 13:15:34 39 16 13:19:27 109 107 06:14:49:03
16Sep94 14:44:47 299 14:48:22 237 14 14:51:58 175 108 06:16:21:52

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

1414. SAREX Elements 9/13 at 12:85 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 12:55:26 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.014.1994@ampr.org>
Source record: 26879
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.014
SAREX Orbital Elements 9/13 at 12:45 UTC

Greenbelt, MD September 13, 1994 at 12:45 UTC

Gil Carman, WA5NOM reports that Element Set GSFC-14, provided by Ron Parise,
WA4SIR, is within 1 second of a current (orbit 59) orbiter state vector.
This element set will be the official SAREX set for today.

STS-64
1 23251U 94059A 94256.35518513 0.00001905 10675-4 74542-5 0 140
2 23251 57.0075 208.5262 0009814 264.2494 95.7470 16.05008849 561

Satellite: STS-64
Catalog number: 23251
Epoch time: 94256.35518513 (13 SEP 94 08:31:27.99 UTC)
Element set: GSFC-014
Inclination: 57.0075 deg
RA of node: 208.5262 deg Space Shuttle Flight STS-64
Eccentricity: 0.0009814 Keplerian Elements
Arg of perigee: 264.2494 deg
Mean anomaly: 95.7470 deg
Mean motion: 16.05008849 rev/day Semi-major Axis: 6638.7031 Km
Decay rate: 0.19E-04 rev/day*2 Apogee Alt: 266.83 Km
Epoch rev: 56 Perigee Alt: 253.80 Km

NOTE - This element set is based on NORAD element set # 014.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX

1415. STS-64 Element Set (94256.355)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 13:30:40 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94256.355@alsys.com>
Source record: 26865
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94256.35518513 +.00001905 10675-4 74542-5 0 140
2 23251 57.0075 208.5262 0009814 264.2494 95.7470 16.05008849 561

Satellite: STS-64
Catalog number: 23251
Epoch time: 94256.35518513 (13 SEP 94 08:31:27.99 UTC)
Element set: GSFC-014
Inclination: 57.0075 deg
RA of node: 208.5262 deg Space Shuttle Flight STS-64
Eccentricity: 0.0009814 Keplerian Elements
Arg of perigee: 264.2494 deg
Mean anomaly: 95.7470 deg
Mean motion: 16.05008849 rev/day Semi-major Axis: 6638.7031 Km
Decay rate: 0.19E-04 rev/day*2 Apogee Alt: 266.83 Km
Epoch rev: 56 Perigee Alt: 253.80 Km

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1416. Re: SAREX Status/Keps 9/12 at 11:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 15:14:21 UTC
From: tboza@sedona.intel.com
Message-ID: <354fkd$kmr@chnews.intel.com>
Source record: 26866
Cross-posted to: rec.radio.amateur.space,sci.space

I heard Susan, KB5IWS, from STS-64 on 145.55 last night making two differnet
QSOs.

She did not call CQ, and From what I understand, "YOU" have to call CQ,
and they (Susan) will answer you.

Tom WB7ASR...

In article <352dvc$ckg@sandra.teleport.com>, philb@teleport.com (Phil Biehl) writes:
> I'm a little new at this. I've been listening for STS-64 for several
> days now and have heard absolutely nothing. My tracking program seems to
> be working ok as it agrees with the display I see from NASA Select. I'm
> listening on 145.55 and xmitting packet on 144.49. I'm using a Isopole
> or a KLM sat crossed yagi with a Yaesu FT-736. I don't hear a peep on
> either the the packet radio or the Yaesu. I adjust the vfo upwards to
> compensate for oncoming doppler and manually adjust the yagi to track
> the shuttle. I leave computer on listening on 145.55 and not a single
> packet sqeak is heard.
>
> Any ideas?
>
> Thanks,
> Phil, N7FWL
> --
> philb@teleport.com Public Access User --- Not affiliated with TECHbooks
> Public Access UNIX and Internet at (503) 220-0704 (2400-14400/9600/14400 N81)

1417. SAREX Anntena Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 18:30:33 UTC
From: dougfree@onramp.net
Message-ID: <dougfree-1309941230330001@dal03.onramp.net>
Source record: 26867

After using MacSPOC to figure out when STS-64 was coming over Dallas To much delight I was Just able to here some transmissions last Sunday. I was using a home made JPole. What is the best antenna configuration for SAREX? Please feel free to EMail.
73s
Doug

Doug Freeman
5952 Joyce Way
Dallas, TX 75225
(214) 750-6822
dougfree@onramp.net
KC5ION

1418. sattrack help

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 21:17:20 UTC
From: perry@jpunix.com
Message-ID: <PERRY.94Sep13161824@jpunix.com>
Source record: 26869

```
-----BEGIN PGP SIGNED MESSAGE-----

I'm curious about plotting when and where the shuttle is going to
be. I just FTP'ed SatTrack and was unable to compile it on my
machine. I went to the ports at freebsd.cdrom.com and theirs wouldn't
compile correctly either. Has anyone who is reading this compiled
SatTrack under FreeBSD 1.1R? For that matter ANY satellite tracking
program that will work under FreeBSD 1.1R is welcome. Any
recommendations are appreciated.
- --

John A. Perry - perry@jpunix.com
Finger perry@jpunix.com for PGP 2.6 public key.
PGP-encrypted e-mail welcome!

-----BEGIN PGP SIGNATURE-----
Version: 2.6.1

iQCVAwUBLnYXQFOTpEThrthvAQG3FAP9EoUcsgsNrcwZ3qoJc39GcRNaYVpzyC2E
8fkvQ5R/eTYB4MvoaQoo2i4Ttck+oCPvowFal0sHu6Jdl2iWDcL6xi0CnSKyunbP
xTIABTUWFs8j1aOBjfjBvUU43MgHVBU3qHqQin4OFp1o07ICLlmoHJO5m90if8k9
ZoV4srchKRo=
=3Uod
-----END PGP SIGNATURE-----
```

1419. STS-64 Orbital State Vector Rev #58

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 21:38:53 UTC
From: astroman@netcom.com
Message-ID: <astromanCw384t.CtJ@netcom.com>
Source record: 26871
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94256.50006497685
09/13/1994 12:00:05.614 UTC
EFG E: -14278268.39 ft
F: 2742516.27 ft
G: 16215161.23 ft
Edot: -14458.2833 ft/s
Fdot: -17260.8833 ft/s
Gdot: -9804.4228 ft/s
ndot/2 (drag): 0.00085873372 rev/day^2
nddt/6: 3.06279E-08 rev/day^3
Bstar: 1.21176E-04 1/Earth Radii
Elset #: 9
Rev @ Epoch: 58.32604086755
.....................................................................

The drag values are estimated by VEC2TLE using a 1.2 drag multiplier.

The next scheduled orbit adjust is Trim Burn 5 (followed shortly by Trim
Burn 6). Trim Burn 5 is scheduled to occur at an MET of 03/16:51:00 which
occurs at approximately 13-Sep-94 / 15:13:55 UTC.

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1420. STS-64 Orbital State Vector Rev #63

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 21:57:14 UTC
From: astroman@netcom.com
Message-ID: <astromanCw38zE.EBK@netcom.com>
Source record: 26870
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94256.79474105324
09/13/1994 19:04:25.627 UTC
EFG E: 10267060.22 ft
F: -18055761.34 ft
G: 6547792.40 ft
Edot: 8195.4835 ft/s
Fdot: 11887.3230 ft/s
Gdot: 19913.8031 ft/s
ndot/2 (drag): 0.00086974138 rev/day^2
nddt/6: 3.14048E-08 rev/day^3
Bstar: 1.17644E-04 1/Earth Radii
Elset #: 10
Rev @ Epoch: 63.05839832164

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1421. Electronic Journal of the ASA (EJASA) - September 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-09-13 22:24:58 UTC
From: klaes@mtwain.enet.dec.com
Message-ID: <3555c0$r52@nntpd.lkg.dec.com>
Source record: 26868
Cross-posted to: sci.edu,sci.lang,sci.physics,rec.radio.amateur.space

THE ELECTRONIC JOURNAL OF
THE ASTRONOMICAL SOCIETY OF THE ATLANTIC

Volume 6, Number 2 - September 1994

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- Michael Hann

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Larry Klaes, EJASA Editor, at the following net addresses or the above
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or - ...!decwrl!mtwain.enet.dec.com!klaes
or - klaes%mtwain.dec@decwrl.enet.dec.com
or - klaes%mtwain.enet.dec.com@uunet.uu.net

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letters to the editor, and ASA membership information.

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include a network and/or regular mail address where you can be reached,
a telephone number, and a brief biographical sketch.

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FTP site at chara.gsu.edu (131.96.5.29). Directory: /ejasa

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A HISTORY OF METEOROLOGY AT THE PIC DU MIDI OBSERVATORY

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and

Jacques Damiens
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1 Quai Branly, 75007 Paris, France

Summary

Meteorology was the main activity of Pic du Midi Observatory until astronomy prevailed around 1937. Three directors, Vaussenat (1882-1892), Marchand (1892-1914), and Dauzere (1920-1937), ensured smooth running of this Observatory, which was often caught in storms and lightning at an altitude of 2,880 meters. They gathered and successfully analyzed the numerous meteorological data obtained by the two observers at the summit.

Introduction

Pic du Midi Observatory, located near Lourdes in the center of the Pyrenees Mountain Ridge in southern France, owes its international renown to the remarkable astronomical observations that were carried out there. However, its vocation for astronomy is recent. The Observatory's long ties to meteorology are worth recounting. In fact, from its founding in 1882 to the naming of an astronomer as director in 1937, meteorology was the principal, and for a long time the only, activity at this Observatory.

The Observatory at Sencours Pass

The project of establishing a meteorological observatory at the summit of the Pic du Midi dates from 1872. The project was launched by the Societe Ramond, a group of men interested in the Pyrenees Mountains. Charles Champion du Bois de Nansouty, a retired general, was named as the head of the project, and Celestin-Xavier Vaussenat, a civil engineer, was charged with presenting the project to the public and collecting money, since the financing of the construction and the running of this private Observatory was to come from private donations.

A temporary meteorological station was established at the Sencours Pass, at an altitude of 2,366 meters, just below the summit of Pic du Midi, in 1873. The observers were lodged at the inn that had been built a few years earlier. The instruments were placed on the Plantade knoll, named for an astronomer who had died there in 1741.

Measuring instruments were also placed at the summit of the Pic du Midi.

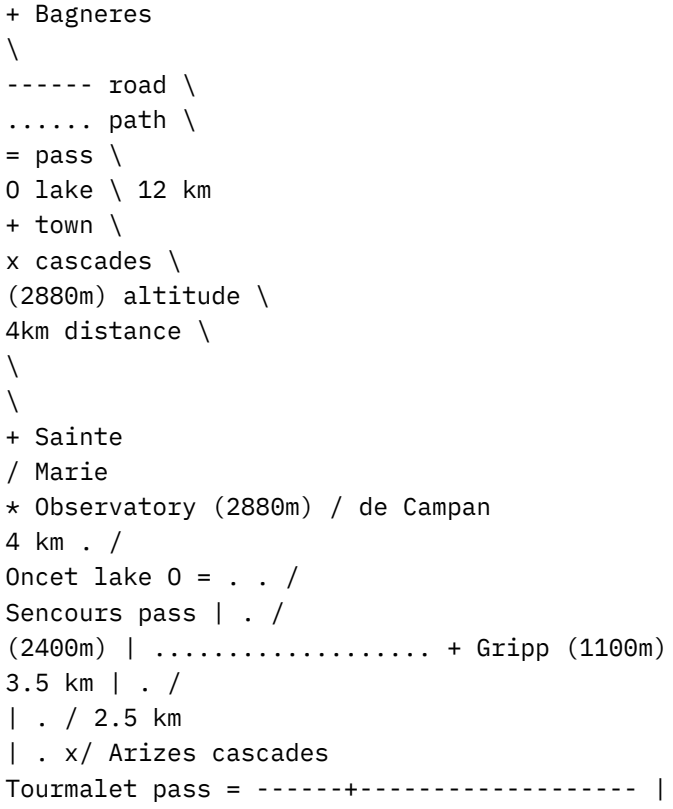
General de Nansouty, observer Baylac, and a cook spent six winters at the pass. Every day they took four series of six to ten meteorological readings at the Plantade knoll, at 7 and 10 a.m. and 4 and 7 p.m.. Once each day, observer Baylac would climb to the summit of the Pic to take a reading at 12:43 p.m. (7 a.m. in Washington, D.C.). The results were transmitted to General Albert Myers, Chief of the United States Signal and Meteorological Service, following the recommendations of the Congress of Vienna.

In 1880, observers could stay in the permanent buildings at the summit of the Pic du Midi. The Observatory was officially inaugurated in 1882 and donated to the State on that date, on condition that the State would take over the 45,000 Franc debt, and that it would give 30,000 Francs a year for the observers' salaries and to maintain the building. Vaussenat was named director.

The Organization of the Observatory

The Pic du Midi Observatory's exceptional location at an altitude of 2,880 meters was not without constraints. The whole story has to be known in order to understand its history until 1952, the date at which the Observatory was linked to the rest of the world by two cable cars, drastically changing life at the summit.

Map of the Access to Pic du Midi Observatory



(2115m) 4km La Mongie (1800m) \ _|
x

At the summit, the personnel was composed of two assistant meteorologists and two general helpers. The first observers were Leandre Ginet and Sylvain Latreille. They carried out both meteorological and astronomical observations. After a preliminary reduction, they transmitted them to Bagneres de Bigorre, where the Director exploited them. In the 1930s, the two assistant meteorologists, Hubert Garrigue and Joseph Devaux, were more than just observers: Both were preparing a thesis on atmospheric electricity and on glacier snow, respectively.

There were more people at the Observatory during the brief summer period, when access was easier. The director, visiting astronomers, naturalists, and physicists stayed there while doing their research. It was at this time of year that the annual inspection (until 1920) by two scientists named by the Central Meteorological Office in Paris took place.

The director ran the Observatory from Bagneres (altitude 550 meters), a small spa in the valley about 27 kilometers away from the Observatory. He was linked to the summit by a telegraph line that was often cut by bad weather conditions. The director was responsible for administration, management, and scientific observations (meteorological, seismological, magnetic, and astronomical). His hardest job was certainly ensuring the smooth running of life at the top, managing supplies (especially when the weather blocked access), human problems, and the correct functioning of the instruments, most of the time from a distance.

A position of assistant meteorologist was created in Bagneres in 1900, which Jean Dort held until 1934. Joseph Bouget, the Observatory botanist, never had a permanent position. He took care of botanical gardens at the summit, in Bagneres, and at several intermediate altitudes. Bouget often observed when one of the incumbents was sick or on vacation. In Bagneres, occasional employees paid by the hour worked as secretaries, accountants, or librarians.

There was an important intermediate stage between Bagneres and the Pic: The Brau Inn at Gripp and the Observatory's depot, 2.5 kilometers after Gripp. Jean Brau, and later his sons, played an essential role in the Observatory's daily life. It was they who organized the conveying of men and food to the summit, in winter as well as in summer. The road suitable for vehicles joining the Tourmalet Pass to the Laquets (altitude 2,600 meters) was built only in 1934 and can only be used in the summer (this is still the case!). Before that date, the only path to the summit was a mule trail. In the winter until 1952 this trail had to be followed to the top, sometimes at the risk of being carried away by an avalanche. Three porters died in this way in November of 1882.

Five to eight hours were needed to climb on foot or skis from Gripp to the summit, depending on weather conditions. Ascents usually took place once each week, but often bad weather prevented them. In the history of the Pic, it very often happened that men would be blocked at the summit without getting supplies for one month or more. Most of the supplies - canned food, wine, fuel - were carried by mules between July and September. The rest of the time, porters carried the supplies on their backs. Since this was very expensive, portages were limited to fresh food and indispensable equipment.

Life at the Summit

Life at the summit was very difficult during the winter, which lasted eight to ten months. Snow fell in October at the latest, and melted only at the beginning of July. At the end of the winter there were often several meters of snow on the terraces (this is still the case!). The buildings were badly heated, poorly insulated against bad weather, and let dampness and even snow come into the structures. The roofs had to be cleared when the weight of the snow threatened to make them collapse, and tunnels had to be dug in the snow to let the light in when the windows were buried.

In an 1886 letter to Eleuthere Mascart, director of the Central Meteorology Office, Marcel Brillouin, a renowned French physicist, describes one of the observers: "Ginet got there such terrible rheumatic pains that he could not put his feet down without suffering. (...) A crack in the vaulted ceiling loaded with snow let water drip into his room until the summer, as long as the snow could not be cleared; and to make sure that everybody else followed the rules, he nevertheless stayed in that room, whose dampness you can imagine."

After the cold and the snow, the main problem facing the men at the Pic was lightning. It is in fact still a problem today. A network of lightning rods, linked by a cable 1,200 meters long to Lake Oncet (below Sencours Pass), ensured a minimum of security and channeled away most of the lightning. This network also eliminated accidents, previously quite frequent, caused by lightning in the upper parts of the valleys leading to the Pic. It sometimes happened, however, that the lightning came up to the summit along the telegraph wire, despite the lightning rods installed all along it.

Storms were (and still are) spectacular at the Pic, as witnessed in a letter from Vaussenat to Mascart, dated July 12, 1887: "Last night, from 9 p.m. to midnight, we were able to observe the most grandiose storm that we have ever seen, and which hit the central Pyrenees and came within a kilometer of our peak. The Pic was unharmed, thanks to our set of lightning rods and their good conductors. But never had we seen the St. Elmo's Fire with such intensity; there seemed to be real fixed, luminous, blue and red centers. The envelopes themselves were luminous. It was fairy-like, it hailed abundantly."

Vaussenat's Direction (1882-1892)

Vaussenat was mainly concerned with improving the installations at the summit, enlarging the terraces, building new shelters or permanent buildings. He was interested in everything that happened at the peak, and carefully noted all the phenomena which attracted his attention: Frost on the windows, on the metal of the doors, St. Elmo's Fires, lightning bolts, and rings around the Moon or the Sun. Vaussenat wrote about them in his letters to Mascart.

Daily meteorological observations were the summit's principal activity, but they did not seem to be well done, according to Marcel Brillouin who inspected the Pic in 1886. "The actinometric observations never made any sense. (...) The anemometer and the weather vane do not show anything in the winter, and mean nothing in the summer. The barometer was empty, and even though observed carefully, the thermo-meters too. As for the hygrometer and the pluviometer, I believe they need special precautions to work correctly."

An important function of the Observatory was to forecast bad weather and to warn the population, a service appreciated by the administration and by farmers. Indeed, the Pic du Midi's privileged location, an isolated peak in the Pyrenees chain, allowed observers to forecast atmospheric disturbances, storms, and also floods of the Garonne, Adour, and Gave de Pau Rivers. Unfortunately, the lack of communications did not always let these warnings be given rapidly.

An important experiment in atmospheric physics was attempted between 1884 and 1887: The Lemstrom experiment, named for the Swedish scientist who tried to produce artificial Aurorae Borealis in 1882. This experiment was suggested by the Central Meteorology Office in 1883 and carried out at the Pic du Midi by Vaussenat. The Pic's summit was covered with a network of 400 square meters of wire ("the Lemstrom network"), in order to tap atmospheric electricity. Unfortunately, the network mostly attracted lightning, with disastrous results for the equipment and danger for the personnel. The experiment had to be given up before giving any scientific results.

Marchand's Direction (1892-1914)

Emile Marchand, the Observatory's second director, established a meteorological station at Bagneres. He also perfected a simple code so that the observers at the summit could give a rapid (less than one quarter of one hour), succinct, but precise description of the cloud cover (with the speed and the altitude of the clouds) several times each day. In this way, he obtained simultaneous readings at two altitudes (550 and 2,880 meters) that were completed by readings at intermediary altitudes taken during ascents of the Pic. He also continued the seismological and magnetic measurements started by his predecessor.

These initiatives let him gather very numerous and complete data which Marchand spent years analyzing. He was thus able to acquire great knowledge of the atmospheric and meteorological phenomena in the neighborhood of the Pyrenees chain. He would make weather forecasts

for the next 24 hours, which were reasonably correct ninety percent of the time.

Among Marchand's works we should mention: A lifelong study of the correlations between solar activity, earthquakes, geomagnetism, and atmospheric physics, a method for establishing a local weather forecast (1911), the effect of the Pyrenees chain on the rainfall and the asymmetry of the region's valleys (1903), and a long study of the temperature and the tension in water vapor (1894-1898). He presented all his works in talks at many colloquia. Unfortunately, most of his works were published in the proceedings of the various colloquia and in obscure publications, like the Bulletin of la Societe Ramond, where they are still waiting to be read.

One of the observers, Sylvain Latreille, was also supposed to make astronomical observations, to take daily readings of sunspots, Moon observations (to search for a lunar atmosphere), Jupiter and Saturn's satellites (ephemerides), and to map the zodiacal light.

It was under Marchand's direction, in 1906 and 1907, that a real astronomical station was installed at the summit of the Pic du Midi by Benjamin Baillaud, who was then director of Toulouse Observatory. A fifty-centimeter equatorial reflector telescope was brought up to the summit in the course of two summers, thanks to the efforts of a group of soldiers of a regiment in Tarbes. It was reserved, though, for astronomers from Toulouse and for visiting astronomers who had to ask permission from Toulouse Observatory's director. This reflector, which was very inconvenient to use, was hardly used until 1942, when it was completely transformed.

Marchand died in April of 1914 and was only replaced at the end of the First World War (1918) by Joseph Rey, a former naval officer who resigned in 1920.

Dauzere's Direction (1920-1937)

The Observatory suffered from the lack of maintenance during the war. Camille Dauzere not only repaired the buildings and the terraces, but also improved living conditions at the summit, built other buildings, and attracted scientists of all kinds.

In 1926, the Observatory became an "Observatory and Institute of Terrestrial Physics", like those in Paris, Clermont-Ferrand, and Algiers.

Dauzere was a physicist. He took up Marchand's meteorological works and, being particularly interested in lightning and hail, tried to link these phenomena to the air's electrical conductivity. He worked more closely with Bouget, who for the past thirty years had been making a detailed study of all the lightning bolts that he knew about in the region. They were thus able to establish some simple rules:

"Lightning preferably strikes certain privileged places, that are not necessarily protuberant points of the ground. The location of those places that are often struck by lightning is related to the nature of the rocks that make up the ground. The areas most exposed to lightning are often located on contact lines between two different geological terrains. (...) Places where hail originates (...) are linked with places where lightning strikes."

The Pic du Midi's astronomical renown began in the 1930s, with Bernard Lyot's work on the solar corona outside periods of eclipse. In 1937, the naming of Jules Baillaud (Benjamin Baillaud's son) as director of the Observatory confirmed this conversion to astronomy.

Conclusion

This brief survey of the history of the Pic du Midi Observatory shows that it was always a high point of interdisciplinary studies. Thanks to the will of several men and to the courage and perseverance of many others, this Observatory allowed scientific progress in very different fields: Meteorology, botany, astronomy, atmospheric physics, particle physics, cosmic rays, physiology, etc. It would be extremely regrettable that the present economic difficulties should lead to its abandon, because its history holds much promise for its future.

Acknowledgments

We would like to thank Mr. J. P. Legrand who told us about the existence of documents on the Pic du Midi Observatory at the archives of Meteo France. This paper has been published in French in "La Meteorologie".

Was this brief history of any interest to you? Please send your comments to Emmanuel Davoust at davoust@obs-mip.fr.

Related EJASA Articles -

"Amateur Astronomy in Spain", by Jordi Iparraguirre - April 1990

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"Kitt Peak and McDonald Observatories: Impressions", by Russell Whigham - October 1990

"A History of Ohio's Perkins Observatory", by Earl W. Phillips, Jr. - February 1992

About the Authors -

Emmanuel Davoust (davoust@srvdec.obs-mip.fr) is an astronomer at Midi-Pyrenees Observatory. He does research on the morphology and dynamics of galaxies, mainly based on observations obtained at Pic du Midi Observatory. Emmanuel is also working on the history of French astronomy and that of Pic du Midi Observatory in particular. He has

published a book on the search for life in the Universe titled THE COSMIC WATER HOLE (MIT Press, 1991).

Jacques Damiens is an archival officer at the main library of the French Meteorological Office. He is interested in the history of meteorology and has published several papers in that field.

MIRROR MAKING CLASS OF 1993: A REVIEW

by Paul Dickson

From the February, 1994 issue of the Saguaro Astronomy Club's newsletter, SACNews, in Phoenix, Arizona

Last summer, fifty people gathered together at Scottsdale Community College in Arizona to grind mirrors for telescopes. Although it was called a class, no grades were given, as the goal was to learn how to build telescopes from the mirror blank up. The class typically met twice each week, with exceptions when the school was closed for holidays or when the East Valley Astronomy Club (EVAC) had their monthly meeting. The class was taught/led by Leon Knott with assistance from his wife Fannie.

In the Beginning

The class held its first meeting on April 29, 1993. This first meeting covered basic mirror math, enough so that class members could choose the f-ratio of their mirror as well as ordering the mirror blanks in the sizes we wanted. Mirror sizes built by the class ranged from four inches up to twenty inches.

The first working meeting was in June, after the mirrors blanks had arrived. In this meeting we beveled the mirror edges to prevent chipping while we did the rough grinding. Those who were still unsure of their f-ratio were given another overview of how to compute the grinding depth needed in the glass.

The class met informally. It was not required that everyone attend all meetings. In fact, with the large size of the class, a few missing people gave everyone else a little more elbow room. For the most part, all of the tools for our mirrors were poured from dental plaster during the first couple of nights. "As much plaster as a dental lab uses in six months", according to Leon.

The meeting after pouring the tools, ceramic tiles were epoxied to the tool. The epoxy was the single most expensive item after purchasing the glass. But it was well worth it: If the tiles were not held in place, then a lot of work could be lost, as one person found out who did not use epoxy.

The Grind

Generating the curve of the mirrors was done with 80 grit particles. This was used to get within a few thousandths of one

inch of our desired depth. Those who had mirrors sixteen inches and larger had their mirrors pre-generated to almost the correct curve, allowing them to skip this first step, which could consume a lot of time for them.

After reaching nearly the correct depth, we switched to 120 grit. After this point, we switched to the next smaller grit size when the surface had a uniform smoothness under a 30X magnifier. The next sizes in sequence were 220 grit, 40 micron, 25, 12, 5, and then 3 micron.

At this point polishing pads were then used with 1 micron serum to accelerate the polishing before moving to the pitch lap. We were told by Leon that he had experimented with the polishing pads in previous classes and their use significantly cut down the number of hours on the pitch lap, but did not replace the pitch lap.

The pitch laps were poured on the ceramic tools when Leon did not already have a tool of the correct size. They were covered in pitch with channels cut to form small squares of pitch maybe 0.75-inch on one side, separated by narrow channels.

The Test

By the time we were well into using the polishing pads, we could now see a reflection off the surface of the glass. It was time to use the Ronchi tester to determine the rough shape of the glass surface. The goal in polishing the mirror was to get the surface as smooth as possible and get the surface spherical. The polishing pads left the surface with a roughness as well causing some zonal errors. These needed to be removed before figuring could take place.

In the Ronchi tester, when the mirror was spherical, the lines in the tester would appear as straight vertical lines. If the lines converged in the center, the center was too high relative to the rest of the mirror's surface. If the lines diverged, then the center was too deep. After making the mirror spherical, figuring would parabolize the shape and the resulting mirror would have lines that diverged to some degree. First, though, we all had to get our mirrors spherical.

The Ronchi tester also showed the roughness of the mirror. On a smooth spherical mirror the vertical lines of the Ronchi tester would appear clear and sharp. The roughness would appear as a haziness at the edge of the vertical lines.

After the mirror was spherical and as smooth as your patience allowed came the figuring. This was done with star laps. The star laps where the same pitch laps but had a four (or more) pointed star cut in the pitch. The center of the star was the center of the pitch lap. The full size lap was still used but a smaller star lap was also used for finer work.

The Strokes

Leon had the class do two different strokes with the pitch laps. The most common was to take the smaller lap and do an edge-to-edge stroke, centering over the part of the mirror where the most work was to be done. This center started at the center of the mirror and moved outward. Since both the mirror and tool were rotated this made the work uniform around the circumference of the mirror. The problems with this is that the smaller tool could do too much if not monitored frequently and could easily add roughness.

The other stoke Leon had the class use was the W-stroke. This stroke moved the tool over most of surface in a W or M fashion. If you got lazy, it could be called a Z-stoke. This used the full size lap and worked quite a bit slower. The points of the stoke were at the points you wanted to do the most work. If you wanted to work out the center then the center of the tool was moved to the edge of the mirror. If you wanted to work the ring midway from the center to the edge, then the tool would only uncover that part of the mirror that was outside the ring.

During the class, Leon would perform the Focault test at home between sessions. This would allow the mirrors time to equalize with the temperature of the testing environment.

The class lasted four months and several people finished their mirrors before the class ended. Most finished theirs shortly after, while a few are still working as you read this. By the end of May 1994, even the twenty-inch mirror was getting its final figuring (the physical plant is huge). Case in point is the author, who has had first light but still has not finished the mounts.

An Example

When I started in the mirror making class, I didn't really want to make a large telescope and I already had an eight-inch instrument. So I decided to make a five-inch one so I could have a telescope that was really portable. Around this same time, an article appeared in SKY & TELESCOPE magazine about a small solar telescope. This left me undecided on which direction to go, but with the cheapness of the five-inch mirror blanks, I decided to grind two mirrors.

I decided to grind one blank first and later, after completing the first mirror, I would start the second. This would allow me to learn from any mistakes I might make rather than duplicating them as I progressed.

It took nearly one week to get started with the rough grinding. First was pouring the dental plaster tool and letting it dry. The tools was hard within a few minutes, but it took time for it to dry completely. After it had dried, we had to epoxy ceramic "bathroom" tiles on to the tool surface. These were allowed to dry pressed against the mirror protected by wax paper. At the beginning of the second week of class, the grit started flying.

On my first mirror, I planned on a f/5.5 which meant I had to grind out 0.057-inch of glass from the center of my mirror. It may not look like much, but it took me seven class sessions to get to depth and start using the Ronchi tester. I also took home sore arms and wrists during the first weeks of rough grinding.

Problems

It only took two more sessions of polishing to completely polish the surface. The surface was really smooth. The trouble was I had a zone on the surface that I could not seem to get rid of. I attempted to polish it out but all attempts only pushed the zone closer or further from the edge.

At this time, everyone else was testing their mirror, too. So the testing cycle with the Ronchi grating was a few minutes of polishing followed by tens of minutes waiting for the tester. At this time, the last few sessions of class, I decided to start my second mirror. I could work on mine with the few others who were still working at 80 grit, far away from those polishing and figuring. I reserved my working on the first mirror to when I was over at Leon's.

After playing with the zone on the mirrors surface for over thirty hours of work, I spent twelve hours at Leon's with his turntable and finally removed the zone. From a nearly spherical mirror, it took less than five hours of work. The resulting mirror was f/5.4 with a surface wavefront error of 1/14-wave done in a total of 72 hours of work.

The Second Mirror

The second mirror was entirely different in both design and implementation. It was supposed to be a five-inch f/8 solar telescope. The reflecting surfaces would be uncoated. Making this mirror had all sorts of surprises. First I used the f/5.4 tool from my first mirror. This caused my second mirror to grind down to 0.057-inch when I really only wanted 0.039-inch. I had ground, in two class sessions, a second f/5.4 mirror. I then had to continue grinding another session to get back to 0.039-inch, adding glass to the middle by actually removing it from the edge.

From beginning to end, my second mirror took just less than 25 hours of work. It is a five-inch f/7.75 with a surface wavefront error of 1/54-wave. Leon's Focault tester is only good to 1/16-wave in resolution, though.

Now I just have to build the physical plants for the telescopes. I looked into a coelestat for the solar telescope so I can mount video equipment on a unmoving telescope, but I decided on an English Yoke instead.

Throughout the class Leon and Fannie remarked on how well the class went. The only problems encountered by class members were minor and easily fixed. No one had serious problems with their mirror surface. My own problems were fairly minor and resulted in doing and

undoing work until I understood which direction I needed to take. The class had one mirror break while being ground (a six-inch) and one person - who did not use the epoxy - lost his tiles while grinding.

The polishing pads did introduce zonal problems on to a large number of class member's mirrors. This did not happen in previous classes that Leon has taught and he is not sure why it did occur. The use of polishing pads will require more experimentation.

The Next Telescope

While waiting for parts and money for completing these two telescopes, I am researching designs for my next telescope: A ten-inch Gregorian convertible Newtonian. It even sounds impressive.

Related EJASA Articles -

"The CHARA Multi-Telescope Telescope", by Hal McAlister - August 1989

"Amateur Telescopes, Yesterday and Today", by Bill Bagnuolo - September 1989

"A Living Legend: The Alvan Clark Refractor", by Alan Fleming - May 1990

"A Comparison of Optical and Radio Astronomy", by David J. Babulski - June 1990

"Low-Budget Astronomy", by Tony Murray - October 1990

"Aperture Arrogance", by Eric Greene - March 1991

"How to Make a High-Quality Fifty-Millimeter Finderscope", by Robert Bunge - December 1991

"The Elusive Dot", by John Stauter - December 1991

"Telescopes: A Novice's Guide", by Steven M. Willows - March 1992

"Astronomical Optics: Exploring the Definitions", by Nils Turner - May 1994

"1993 Arizona Messier Marathon", by A. J. Crayon - June 1994

"1994 Arizona Messier Marathon", by A. J. Crayon and Paul Dickson - June 1994

About the Author -

Paul Dickson has been a member of the Saguaro Astronomy Club (SAC) since 1988 and has been the Editor of SACNews for more than three years. Paul is currently a student at Arizona State University. Paul has contributed a number of articles from SAC to the EJASA. His network address is p.dickson@asu.edu.

Paul is the author of the following EJASA articles:

"Grand Canyon Star Party" - May 1993

"181st American Astronomical Society (AAS) Meeting" (with Mike Willmoth) - July 1993

"The Perseids from Arizona" - September 1993

"1994 Arizona Messier Marathon" (with A. J. Crayon et al) - June 1994

YOU CALL IT WHAT?

by M. Leon Knott

From the March, 1993 issue of the Saguaro Astronomy Club's newsletter, SACNews, in Phoenix, Arizona

Well, here we are, class. Summer, with its hazy skies and too hot temperatures has given way to blessed fall, with cooler temperatures and incredible skies. Now is the time to take out those new binoculars, telescope, star charts, or books you just could not resist, as you begin mining the riches of the night time sky.

Right away, with the general cussedness and perverseness of life, you face a seemingly impossible task. All those stars have such unusual names and just how do you really pronounce something like Betelgeuse and some others even worse? After all, one does not wish to appear unknowing about such elementary things when in the company of friends, spouses, students, ministers, and school teachers, right?

I recently experienced such a problem when visited by the late well-known Walter Scott Houston, author of SKY & TELESCOPE magazine's "Deep Sky Wonders" column for nearly 47 years. Sitting in our living room, we were talking about galaxies, clusters, and nebulae when I happened to mention the beautiful double star in Orion we know as Rigel (rhymes with a well-known antacid). Mr. Houston looked at me and said, "It's Rigel (rhymes with regal)." To which I replied, "Rigel (rhymes with that well-known antacid)."

At that point the famous Walter Scott Houston glared at me and said, "How many advanced degrees do you have?" When I answered that I had one degree and that it did not amount to very much, he said "Well, I have three degrees and two fellowships. It's Rigel (rhymes with regal)."

Glancing up, I could see my wife Fannie and two daughters, Dottie and Kana, smirking at me, and believe me I know how to pronounce "smirking." Well, Mr. Houston has gone back home, and in the spirit of modest correctness, I hereby affirm that the proper pronunciation of Rigel is Rigel (rhymes with that well-known antacid).

So, in an attempt to share with you my grammatical, syntactical, and pronounciational expertise, and in order to help you become better acquainted with the names of several famous stars, I have drawn up the following short list. If you learn to pronounce the names of these stars properly, you can hold your head high in any crowd and put to

shame anyone who might presume to correct you, whether PhD, school teacher, or even high school kid. If someone does try to push too hard, just tell them you read it here and that ought to be good enough to silence even the most adamant and obdurate.

Let us begin with the bright stars in Orion, since that brilliant constellation commands the fast approaching winter skies. This starry warrior has beacons marking out his shoulders, his belt, and of course, his left foot (Rigel - you already know how to say that), along with his right knee. The bright star that does signify Orion's right knee is Saiph. You will be perfectly safe in pronouncing it "safe" with just a tiny bit of emphasis right in the middle of the word; you know, as if you suddenly realized that an insect had entered your mouth and was conducting extensive and probing explorations in there.

Orion's right shoulder is Bellatrix, and you might say Bellatrix is for kids. On the other hand, his left shoulder is Betelgeuse, and I defy anyone to pronounce it "Beetle Juice" within my hearing. I just simply will not stand for it. You had be much safer in pronouncing it as if it were spelled "Bet Old Joy." Now, doesn't it feel really good when you get it right?

The three stars making up Orion's belt are very famous and are known as Mintaka, Alnitak, and Alnilam. I dare you to say all three name, quickly as you can, three times in a row! These stars point to the eastern direction and help us locate the brightest star in the heavens. This star is seriously bright and is named Sirius. You might even call it Seriously Sirius, if you know what I mean.

Letting the belt lead us in the opposite direction will point us to the glaring red eye of Taurus (like the well-known automobile) the Bull. This bright red star is named Aldebaran. Here, you might say "The Bull attacks us....Al, Deb, and I run (Aldebaran) while Ann tarries behind (Antares, the name of the Scorpion's heart, seen during the summer. I threw it in for free)." Poor Ann.

Well, you have been marvelous students and this is enough for a first session. Later we will cover such important names as Arcturus, Zubeneshamali, Algenubi, Mirach, and perhaps, even Uranus. Being an amateur is fun and informative. It can also give rise to some justifiable pride and perhaps even some gentle snob appeal, especially when we can pronounce all those tough words correctly, with confidence and verve arising out of knowing we are right and all those other guys are wrong.

Related EJASA Articles -

"Orion: Winter's Mighty Hunter", by Michael S. Wiggs - December 1989

"In Search of the Horsehead Nebula", by Eric Greene - April 1991

"Astronomy and the Family", by Larry Klaes - May 1991

"The Hyades: A Star Cluster Rich in Myth and Astronomy", by Ken Poshedly and Don Barry - June 1992

"Celestial Favorites of Autumn", by Bruce Bowman - October 1993

About the Author -

M. Leon Knott is an amateur astronomer interested in observing and telescope making. Recently from the U.S. East Coast, he is now living in Mesa, Arizona. He has written for SKY & TELESCOPE, ASTRONOMY, THE MOTHER EARTH NEWS MAGAZINE, and TELESCOPE MAKING. In addition he is an Associate Editor of the new AMATEUR TELESCOPE MAKERS JOURNAL and Newsletter Editor for the East Valley Astronomy Club (EVAC).

Mr. Knott is author of and discussed in the following EJASA articles:

"Cometary Conundrums" - June 1993

"Hunting for Comets: One Observer's Success Story", by Michael Janes - March 1994

"1993 Arizona Messier Marathon", by A. J. Crayon - June 1994

"1994 Arizona Messier Marathon", by A. J. Crayon and Paul Dickson - June 1994

"Mirror Making Class of 1993: A Review", by Paul Dickson (this issue)

UP ALL NIGHT: OBSERVING THE PERSEID METEOR SHOWER OF 1994

by Michael Hann

Courtesy of the Astronomy Club of Tulsa, Oklahoma newsletter

A good Perseid meteor shower was observed by three hardy Astronomy Club of Tulsa members who maintained their watches from dusk to dawn at the RMCC observatory at Mounds, Oklahoma (35 degrees 45 minutes North Latitude, 96 degrees West Longitude) on August 11-12, 1994.

The sky was cloudless, though a thin haze reduced the limiting magnitude to 5.5. A generous portion of bright meteors were seen as the shower's peak approached, including one brilliant, bluish -7 magnitude Perseid which left a thirty-second train. A -5 magnitude bluish Perseid appeared to be sparking as it traversed the sky, flared at the end of its path, and then exploded. I observed a Zenithal Hourly Rate (ZHR) of 98 during the interval of 3:30-4:30 a.m., the peak of the shower as observed at Mounds (see the following comments about preliminary reports from California).

Note that the ZHR is a rate corrected for limiting magnitude and shower radiant angular altitude and is not the same as the total number of meteors one observes in one hour. Twenty-six percent of the Perseids I observed were accompanied by trains - persistent, glowing trails.

The Perseids were supplemented by meteors from other radiants, including Kappa Cygnids, Capricornids, and Pegasids. One "meteor" slowly streaked across the sky for a full ten seconds, moving from the southeast to northwest. I assume this to have been some artificial space debris falling back into Earth's atmosphere.

The following histogram represents the number of Perseids I observed in each of the hourly intervals. Data for meteors from other radiants is not included. I did not observe in earnest until 11:30 p.m. (4:30 UT), as the shower was not very active earlier. Central Daylight Time (CDT) is five hours behind Universal Time (UT), the reference time used in all the following data.

```
Hour Interval
----------------
2:30 - 3:29 UT | 1
3:30 - 4:29 UT | 1
4:30 - 5:29 UT | 12345678901
5:30 - 6:29 UT | 1234567890123456
6:30 - 7:29 UT | 123456789012345678
7:30 - 8:29 UT | 1234567890123456789
8:30 - 9:29 UT | 123456789012345678901234567890123456789
9:30 - 10:29 UT | 12345678901234567890123456789012345
------------------------------------------>
Number of Meteors Observed
--------------------------
```

The ZHRs for each of the hourly intervals beginning with the interval 4:30 - 5:29 UT are given next. I calculated the ZHRs following the method presented by Neil Bone in his book METEORS.

```
ZHR = count*(1/sin(angular altitude))*(r^(6.5 - LM)) +- Error
Error = +-ZHR/SQRT(hourly count)
```

Where r is the population index factor. I calculated three sets of ZHRs based on r = 2.2 (per the Royal Astronomical Society of Canada's Observer's Handbook 1994), r = 2.35 (per Neil Bone), and r = 2.6 (per the International Meteor Organization, IMO).

```
ZHRs
Hourly Interval r = 2.2 r = 2.35 r = 2.6
--------------- ------- -------- -------
4:30 - 5:29 UT 46 +- 14 49 +- 15 54 +- 17
5:30 - 6:29 UT 55 +- 14 59 +- 15 65 +- 17
6:30 - 7:29 UT 54 +- 13 58 +- 14 64 +- 15
7:30 - 8:29 UT 51 +- 12 54 +- 12 60 +- 13
8:30 - 9:29 UT 92 +- 15 98 +- 16 108 +- 18
9:30 - 10:29 UT 86 +- 15 92 +- 16 102 +- 18
```

These rates compare well with peak rates of other Perseid showers.

The following histogram represents the magnitude distribution observed during the shower.

```
Magnitude Range
---------------
(+5.5) - (+4.6) mag | 1234
(+4.5) - (+3.6) mag | 12345678901234567890123456
(+3.5) - (+2.6) mag | 123456789012345678901234567890123456
(+2.5) - (+1.6) mag | 1234567890123456789012345678
(+1.5) - (+0.6) mag | 12345678901234567890123456
(+0.5) - (-0.4) mag | 1234567
(-0.5) - (-1.4) mag | 123456
(-1.5) - (-2.4) mag | 1234
(-2.5) - (-3.4) mag | 12
(-3.5) - (-4.4) mag | 1
(-4.5) - (-5.4) mag | 123
(-5.5) - (-6.4) mag |
(-6.5) - (-7.4) mag | 1
----------------------------------------->
Number of Meteors in Magnitude Range
------------------------------------
```

The average meteor brightness in each of the hourly intervals beginning with the interval 4:30 - 5:29 UT are given next.

```
Hourly Interval
---------------
4:30 - 5:29 UT : 3.8 magnitude on average
5:30 - 6:29 UT : 3.1 magnitude on average
6:30 - 7:29 UT : 3.1 magnitude on average
7:30 - 8:29 UT : 1.9 magnitude on average
8:30 - 9:29 UT : 1.2 magnitude on average
9:30 - 10:29 UT : 1.3 magnitude on average
```

It is acknowledged that the Perseid shower now has two peaks: A traditional peak and an earlier peak which is associated with a higher portion of bright meteors as well as higher ZHRs. The peak I observed was the new peak, as evidenced by the increased average brightness during the peak hour interval.

Joe Dellinger, one of the hardy three who stayed up all night at the observatory, and who has recently moved to Tulsa from Hawaii, sent me E-Mail reporting that ZHRs reached a peak of 250 as observed at Honey Lake, California, after dawn had broken in Mounds.

Related EJASA Articles -

"Astronomy and the Family", by Larry Klaes - May 1991

"Perseids 1993: Shower or Storm?", by Peter Brown - June 1993

"The Perseids from Arizona", by Paul Dickson - September 1993

"In Pursuit of Comet Swift-Tuttle", by Harry Taylor - September 1993

About the Author -

Michael Hann developed an interest in amateur astronomy as a child growing up in rural Illinois. This interest lay dormant for a long time until reawakened several years ago while laying in the autumn leaves of his backyard, looking up at the sky with his two year-old son. Michael is now a member of the Astronomy Club of Tulsa and enjoys leading observation sessions for public groups at the club's RMCC observatory - which houses a sixteen-inch Newtonian reflector telescope - observing with his 10x70 binoculars, and watching meteor showers.

Michael works as a software engineer. He intends to design and construct a forward scatter radio meteor detection system during the next year and welcomes any advice you might wish to give him on this topic. Please send E-Mail to mikeh@ssd.fsi.com.

ANNOUNCING A NEW PUBLICATION: SETIQUEST MAGAZINE

by Carl Helmers

SETIQuest is a new quarterly print/electronic mail (E-mail) periodical containing news, technical information, and tutorials devoted to bioastronomy and its subset, SETI (Search for Extraterrestrial Intelligence).

SETIQuest is published for professionals, serious amateur astronomers, and individuals curious about this fascinating field of observation. SETIQuest fills the need for a specialized astronomical publication devoted exclusively to the on-going search for evidence of life in the Universe. Such evidence could be intentional or inadvertent signals of other civilizations. Such evidence could be found in spectral signatures of biological activity on extrasolar planets or in the interstellar medium.

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Related EJASA Articles -

"Does Extraterrestrial Life Exist?", by Angie Feazel - November 1989

"Suggestions for an Intragalactic Information Exchange System", by Lars W. Holm - November 1989

"Radio Astronomy: A Historical Perspective", by David J. Babulski - February 1990

"Getting Started in Amateur Radio Astronomy", by Jeffrey M. Lichtman - February 1990

"A Comparison of Optical and Radio Astronomy", by David J. Babulski - June 1990

"The Search for Extraterrestrial Intelligence (SETI) in the Optical Spectrum, Parts A-F", by Dr. Stuart A. Kingsley - January 1992

"History of the Ohio SETI Program", by Robert S. Dixon - June 1992

"New Ears on the Sky: The NASA SETI Microwave Observing Project", by Bob Arnold, the ARC, and JPL SETI Project - July 1992

"First International Conference on Optical SETI", by Dr. Stuart A. Kingsley - October 1992

"Conference Preview: The Search for Extraterrestrial Intelligence (SETI) in the Optical Spectrum", by Dr. Stuart A. Kingsley - January 1993

"Detectability of Extraterrestrial Technological Activities", Part 1, by Guillermo A. Lemarchand - December 1993

"Detectability of Extraterrestrial Technological Activities", Part 2, by Guillermo A. Lemarchand - January 1994

About the Author -

Carl Helmers, President and Editorial Director, Helmers Publishing, Inc.. Publishers of SENSORS, ID SYSTEMS, and SETIQuest magazines (what else do you do after starting BYTE?).

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1422. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 00:16:01 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779501761@afit.af.mil>
Source record: 26891
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 64
1 23251U 94059A 94256.25000000 .00001905 10675-4 74542-5 0 146
2 23251 57.0075 209.0222 0009815 264.0288 207.9860 16.05007730 538
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1423. C-64 sat track

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 01:52:15 UTC
From: s5300021@nickel.laurentian.ca
Message-ID: <1994Sep13.205215.1@nickel.laurentian.ca>
Source record: 26874

Hello... My Mac has been kidnapped by the XYL and now all I have left in the shack is my trusty c-64. Would anyone know of a sat tracking program for the sixty four ?

Barry VE3ZLB sudbury ont canada.

1424. SAREX Update 9/14 at 2:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 03:18:22 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.015.1994@ampr.org>
Source record: 26880
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.015
SAREX Update 9/14 at 2:30 UTC

Silver Spring, MD, September 14 1994 at 2:30 UTC

SAREX Contact on Satcom C1 Satellite Downlink

Those who wish to see a SAREX school group contact in action and have
access to a C-band TVRO dish will have a special treat later today.
The Step/STAR Schools Young Astronaut group, located in Spokane, Washington,
will talk to the space shuttle astronauts through a special telebridge link
which is expected to begin at appoximately 18:10 UTC. This contact will be
broadcast live via the Satcom C1 satellite on transponder 18. C1 is also
designated F1 and is located at 137 degrees West Longitude.

School Group Status

8 of the 10 planned school group contacts have now been successfully completed.
The Springfield Plains Elementary, in Clarkston, Michigan had an outstanding
9 minute contact with mission specialist Jerry Linenger, KB5HBR. 26 questions
were asked by the students during this event. Reports from the coordinators
at all the schools have been thankful of the outstanding educational program
that SAREX provides the students. At the Crystal Lake South Elementary school
in Illinois, the students got an "elementary" demonstration of circular
polarization. The technical team at the school demonstrated to the students
that left hand polarization of their antenna provided up to a 4 S unit
improvement in the signal over right hand circular polarization for some
portions of the pass over the Chicago area. Chalk up another one for SAREX
volunteer ingenuity!

General Voice and Packet QSOs

We have gotten several reports from radio amateurs and the shuttle crew that
general voice QSOs are being made. Please remember that the astronauts
are not awake around the clock. Their 8 hour sleep period ends at 11:22 UTC
on 9/14, at 9:52 UTC on 9/15, at 10:22 on 9/16 & 9/17 and at 9:52 UTC on 9/18.
Also, as I reported at the beginning of this flight, Shuttle power
conservation measures, required to support an extra (10th) day of flight, has
resulted in no packet radio operation to date. It is hoped that the packet
system will be turned on later in the flight. The SAREX team will keep you
posted. Please remember to listen on the downlink frequency (145.55 MHz) for
the packet activity BEFORE sending packet connects to the Space Shuttle.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
/EX

1425. Re: MIR Info

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 04:23:36 UTC
From: aa0ok@delphi.com
Message-ID: <JuySf+w.aa0ok@delphi.com>
Source record: 26876

Terry Lisansky <lisansky@strauss.udel.edu> writes:

>Mir is simplex on 145.55. The problem with a verticle is there is little
>or no signal radiated up. That's what makes a good verticle, a pattern to
>the horizon. So here's the catch 22. Your signal is best on the horizon
>when MIR is farthest away, and worse when MIR is closest (when straight
>overhead). You need to know when MIR comes over the horizon, and try

I wonder what would happen if you turned your vertical on its side and made it
a horizontal? Would this allow communication when Mir was overhead?
Steve Kelly
AA0OK@delphi.com
"As a matter of fact, my views do represent my employers.

1426. Re: SAREX Anntena Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 11:07:17 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <940914110717000008@g0oanint.demon.co.uk>
Source record: 26907

In article <dougfree-1309941230330001@dal03.onramp.net>, Doug Freeman writes:

>
>
> After using MacSPOC to figure out when STS-64 was coming over Dallas To much delight I was Just able to here some transmissions last Sunday. I was using a home made JPole. What is the best antenna configuration for SAREX? Please feel free to EMail.
> 73s
> Doug
> ----------
>
> Doug Freeman
> 5952 Joyce Way
> Dallas, TX 75225
> (214) 750-6822
> dougfree@onramp.net
> KC5ION

Hello Doug,

The simplest ant I have used to work the shuttle has been a pair of crossed dipoles. It's is as the name would suggest just two halfwave dipoles laid out horizontally and at right angles to each other, so they form a "X" if you like and phased with a 1/4 wave matching stub. You should be able to buy one quite easily from a good ham shop or if you like I'd be more than happy to mail you with the details of how to build one.

Question for you if I may, where can I get a copy of MacSPOC ?

Kind regards,

Sean.

1427. AO-13 schedule changed or not?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 14:15:47 UTC
From: Wayne_Estes@csg.mot.com
Message-ID: <9409140915.ZM6959@SALCIUS2>
Source record: 26873
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

Oscar 13 still seems to be on the "pre-Sept. 12" transponder schedule, with mode S from MA 120-150, and Mode B afterwards.

Signals are very strong, indicating that maybe the attitude hasn't changed.

Has the schedule change and/or attitude change been postponed?

73 de Wayne Estes WD5FFH Wayne_Estes@csg.mot.com

--
Wayne A. Estes
Motorola Asia-Pacific Cellular Subscriber Division
600 N. U.S. Hwy. 45, Rm. A-S345
Libertyville, IL 60048-1286
PHONE: 1-708-523-2386 Z-MAIL: wayne@csg.mot.com
FAX: 1-708-523-8795 POST: w10191@email.mot.com

1428. Re: SatTrack problems

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 15:38:08 UTC
From: perry@jpunix.com
Message-ID: <3575d1$vm@jpunix.com>
Source record: 26875

```
-----BEGIN PGP SIGNED MESSAGE-----

Hello Everyone,

A couple of days ago I posted a message asking about how to compile
SatTrack under FreeBSD 1.1R. I have since received several replies.
Unfortunately I had hard disk problems and lost the email from the
individuals that replied. If you are one of these people, can you email me
one more time? Thanks in advance.

-----BEGIN PGP SIGNATURE-----
Version: 2.6.1

iQCVAwUBLncX5FOTpEThrthvAQHRaQP/dgUKtq23F4pPk5v/Eo1Oi7So6Y7+K2cS
ZJ3o2l9tZHCWUK/aJjbIXmcaKxD+X8DMfVjvxZLoaNddJUIKBAOZ+zLDaVYxmeOi
kX6sSd2Zh5Pia5FTUrItwXEWVji89eowYxzVSgeVVKlJiNWdfIkkd2I8iQGvk6ga
dgx2I7EoV8o=
=IcrL
-----END PGP SIGNATURE-----

--

Finger perry@jpunix.com for PGP 2.6 public key.
PGP-encrypted e-mail welcome!
```

1429. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 20:25:15 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779574315@afit.af.mil>
Source record: 26878

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 64
1 23251U 94059A 94257.05513640 .00002039 10686-4 74625-5 0 192
2 23251 57.0109 205.2182 0008652 271.8373 174.6719 16.05429747 661
1994059B
1 23253U 94059B 94257.10240447 .00288089 48389-4 39331-3 0 29
2 23253 57.0048 204.9964 0009569 267.0568 92.9980 16.05761180 33
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1430. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 20:25:29 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779574329@afit.af.mil>
Source record: 26890
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 64
1 23251U 94059A 94257.05513640 .00002039 10686-4 74625-5 0 192
2 23251 57.0109 205.2182 0008652 271.8373 174.6719 16.05429747 661
1994059B
1 23253U 94059B 94257.10240447 .00288089 48389-4 39331-3 0 29
2 23253 57.0048 204.9964 0009569 267.0568 92.9980 16.05761180 33
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1431. Re: List of LEO Satellite companies needs completion

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 20:28:11 UTC
From: dave_payne@qmail4.nba.trw.com
Message-ID: <357mcr$bqm@ns1.nba.TRW.COM>
Source record: 26877
Cross-posted to: sci.geo.satellite-nav,rec.radio.amateur.space,rec.radio.amateur.digital.misc

LEO Mobile Satellite Communications Systems on the Horizon

• MSS "Little" LEO's Below 1 Ghz
LEO ONE Panamericana (LEO ONE), Mexico • 8 Satellites
OSC (Orbcom), USA • 36 Satellites
Smallsat (Gonetz), Russia • 36 Satellites
Starsys (Starnet), USA • 24 Satellites
VITA (VITA), USA • 2 Satellites
+ Others: e.g. TAOS/S80T (France), Temisat (Italy), Ariadne (Ukraine), etc.

• MSS "Big" LEO's Above 1 Ghz
Constellation Communcations, Inc. (Aries), USAA •••48•Satellites
ELLIPSAT CORP. (ELLIPSO), USA • 16 Satellites
Loral/Qualcomm Satellite Sevices (Gobalstar), USA ••48•Satellites
Motorola (Iridium), USA • 66 Satellites
TRW (Odyssey), USA • 12 Satellites
+ Others: e.g. Signal (Russia), Project 21 (Inmarsat), LEO1 (Tonga, etc.)
• FSS Broadband LEO's at 20-30 Ghz
Teledesic Corporation (Teledesic), USA • 924 Satelllites

1432. Re: SAREX Status/Keps 9/12 at 11:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-14 22:36:24 UTC
From: garym@alsys.com
Message-ID: <Cw55Go.Bs1@alsys.com>
Source record: 26882
Cross-posted to: rec.radio.amateur.space,sci.space

In <354fkd$kmr@chnews.intel.com> tboza@sedona.intel.com (Thomas A. Boza~) writes:
>I heard Susan, KB5IWS, from STS-64 on 145.55 last night making two differnet
>QSOs.
>She did not call CQ, and From what I understand, "YOU" have to call CQ,
>and they (Susan) will answer you.

Don't call CQ or their callsign, say just *your* callsign using ITU
phonetics and _nothing_ else.

Even if they don't pick out your callsign and answer you it will be recorded
on their tape recorder and may be recognizable when they analyze the tapes
on the ground.

--GaryM
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)

1433. QSL Info for STS-64?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 02:38:48 UTC
From: btaylor@nbnet.nb.ca
Message-ID: <btaylor.85.0@nbnet.nb.ca>
Source record: 26886

Hi there,

I'm new to this group so I'm sorry if I'm asking this question in the wrong place or at the wrong time.

I've just worked Blaine, KC5HBS in the Shuttle and I am looking for QSL information. Can anyone help?

Please post here or e-mail to btaylor@nbnet.nb.ca

Thanks!

Brent Taylor VE1JH
FN66wn
New Brunswick, Canada

1434. Re: C-64 sat track

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 10:16:36 UTC
From: n4hy@harder.ccr-p.ida.org
Message-ID: <N4HY.94Sep15101636@harder.ccr-p.ida.org>
Source record: 26884

WOW. I wrote one many years ago, one that even ran the rotators. I
<<THINK>> it is still available from AMSAT HQ at (301)-589-6062.

Bob

Robert W. McGwier | n4hy@ccr-p.ida.org: ham radio, scouts,
Center for Communications Research | astronomy, golf (o yea, & math!) ASM
Princeton, N.J. 08520 | Troop 5700, ACM Pack 53, Sanhican #2 WWW,
(609)-279-6240(v) (609)-924-3061(f)| District and Council Activities Chair.
(609-443-8963 (h) | I used to be a Buffalo . . . NE III-120
--
Robert W. McGwier | n4hy@ccr-p.ida.org: ham radio, scouts,
Center for Communications Research | astronomy, golf (o yea, & math!) ASM
Princeton, N.J. 08520 | Troop 5700, ACM Pack 53, Sanhican #2 WWW,
(609)-279-6240(v) (609)-924-3061(f)| District and Council Activities Chair.
(609-443-8963 (h) | I used to be a Buffalo . . . NE III-120

1435. SAREX Keps 9/15 at 15:15 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 11:21:44 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.016.1994@ampr.org>
Source record: 26888
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SAREX @ AMSAT $STS-64.016
SAREX Keps 9/15 at 15:15 UTC

Silver Spring, MD September 15, 1994 at 15:15 UTC

The following represents the latest Keplerian Elements as
generated by Ron Parise, WA4SIR, at the Goddard Space Flight Center and
checked by Gil Carman, WA5NOM, at the Johnson Space Center.

STS-64
1 23251U 94059A 94258.03631399 0.00002177 10701-4 73754-5 0 219
2 23251 57.0069 200.5903 0010110 266.8542 93.1385 16.06008884 838

Satellite: STS-64
Catalog number: 23251
Epoch time: 94258.03631399 (15 SEP 94 00:52:17.53 UTC)
Element set: GSFC-021
Inclination: 57.0069 deg
RA of node: 200.5903 deg Space Shuttle Flight STS-64
Eccentricity: 0.0010110 Keplerian Elements
Arg of perigee: 266.8542 deg
Mean anomaly: 93.1385 deg
Mean motion: 16.06008884 rev/day Semi-major Axis: 6635.9469 Km
Decay rate: 0.22E-04 rev/day*2 Apogee Alt: 264.27 Km
Epoch rev: 83 Perigee Alt: 250.85 Km

NOTE - This element set is based on NORAD element set # 021.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX
```

1436. satellite rig

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 11:37:47 UTC
From: joed@iglou.iglou.com
Message-ID: <1994Sep15.113747.10842@iglou.com>
Source record: 26894
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

```
--
<------------------------------------------------------------------------>
KC4UYG Chris Dawson
Joe Dawson geneaology
>>>>==========> Email joed@iglou.com <==========<<<<
```

1437. STS-64 Element Set (94258.036)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 13:30:54 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94258.036@alsys.com>
Source record: 26885
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94258.03631399 +.00002177 10701-4 73754-5 0 219
2 23251 57.0069 200.5903 0010110 266.8542 93.1385 16.06008884 838

Satellite: STS-64
Catalog number: 23251
Epoch time: 94258.03631399 (15 SEP 94 00:52:17.53 UTC)
Element set: GSFC-021
Inclination: 57.0069 deg
RA of node: 200.5903 deg Space Shuttle Flight STS-64
Eccentricity: 0.0010110 Keplerian Elements
Arg of perigee: 266.8542 deg
Mean anomaly: 93.1385 deg
Mean motion: 16.06008884 rev/day Semi-major Axis: 6635.9469 Km
Decay rate: 0.22E-04 rev/day*2 Apogee Alt: 264.27 Km
Epoch rev: 83 Perigee Alt: 250.85 Km

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1438. Re: MIR Info

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 13:50:04 UTC
From: lisansky@strauss.udel.edu
Message-ID: <359jec$ivt@strauss.udel.edu>
Source record: 26883

>I wonder what would happen if you turned your vertical on its side and made it
>a horizontal? Would this allow communication when Mir was overhead?

Probably, but it would have to be perpendicular to the flight path. I
also would not want to radiate down into my house.
Terry

--
Terry Lisansky (lisansky@strauss.udel.edu)
Give me a fast ship.....
For I intend to go in harms way.

1439. Fax and Wefax on PK232MBX

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 20:49:55 UTC
From: beau@enterprise.america.com
Message-ID: <35ac1j$hii@enterprise.america.com>
Source record: 26887

Does anyone have any info on software for the PK232MBX for copying
Fax and Wefax. I have checked several FTP sites and cant seem to
find any.

```
_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/ _/
_/ _/
_/ Internet = beau@enterprise.america.com _/
_/ VHF Packet = kd4gfy@kb4t.#dabfl.fl.usa.na _/
_/ _/
_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/
```

1440. ARLS029 SAREX voice and packet

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 20:59:45 UTC
From: w1aw@arrl.org
Message-ID: <$arls029.1994@ampr.org>
Source record: 26892
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS029
ARLS029 SAREX voice and packet

ZCZC AS73
QST de W1AW
Space Bulletin 029 ARLS029
From ARRL Headquarters
Newington, CT September 15, 1994
To all radio amateurs

SB SPACE ARL ARLS029
ARLS029 SAREX voice and packet

Shuttle Voice and Packet QSOs

NASA Mission Control reports that the Space Shuttle Discovery continues to perform without any system problems at an altitude of 140 nautical miles. Astronauts Carl Meade and Mark Lee are preparing today for Friday's untethered spacewalk.

Earlier this week, mission managers gave the go ahead to extend the mission an extra day after evaluating electrical power usage thus far. The latest margins showed electrical power consumption is running below pre-flight predictions to provide enough hydrogen and oxygen to permit an extra day of science data. The STS-64 mission now is scheduled to conclude with a landing September 19 in the early afternoon.

This mission has proven to be very successful for the Shuttle Amateur Radio EXperiment payload. Already, 9 of 10 scheduled schools have made successful ham radio contacts with the shuttle crew. The SAREX Working Group has also received dozens of reports from radio amateurs and the crew that general voice QSOs are being made. Please remember that the astronauts are not awake around the clock. Their 8 hour sleep period ends at 1022 UTC on 9/16 and 9/17 and at 0952 UTC on 9/18. Also, as has been reported since the beginning of this flight, shuttle power conservation measures, required to support the extra day of flight, have resulted in no packet radio operation to date. It is still hoped that the packet system will be turned on later in the flight. SAREX is currently functioning in configuration B, which means the handheld SAREX transceiver is being operated by battery. The SAREX team will keep you posted of any changes. Please remember to listen on the downlink frequency, 145.55 MHz, for packet activity before sending packet connects to the space shuttle.

The crew uses separate receive and transmit frequencies. Please do not transmit on the shuttle's downlink frequency. The shuttle's worldwide SAREX downlink frequency is 145.55 MHz. Stations may transmit to the shuttle on FM voice at 144.91, 144.93, 144.95, 144.97 and 144.99 MHz. In Europe, stations use 144.70, 144.75 and 144.80 MHz. The crew call signs are KB5SIW, KC5HBS and KC5HBR. The worldwide packet uplink frequency is 144.49 MHz. The packet call sign is W5RRR-1.

Amateurs should transmit only when the shuttle is within range for a contact and you can hear the shuttle's downlink signal. The following represents the latest Keplerian Elements as generated by Ron Parise, WA4SIR, at the Goddard Space Flight Center and checked by Gil Carman, WA5NOM, at the Johnson Space Center.

STS-64
1 23251U 94059A 94258.03631399 0.00002177 10701-4 73754-5 0 219
2 23251 57.0069 200.5903 0010110 266.8542 93.1385 16.06008884 838

Satellite: STS-64
Catalog number: 23251
Epoch time: 94258.03631399 (15 SEP 94 00:52:17.53 UTC)
Element set: GSFC-021
Inclination: 57.0069 deg
RA of node: 200.5903 deg Space Shuttle Flight STS-64
Eccentricity: 0.0010110 Keplerian Elements
Arg of perigee: 266.8542 deg
Mean anomaly: 93.1385 deg
Mean motion: 16.06008884 rev/day Semi-major Axis: 6635.9469 Km
Decay rate: 0.22E-04 rev/day2 Apogee Alt: 264.27 Km
Epoch rev: 83 Perigee Alt: 250.85 Km

Thanks to Frank H. Bauer, KA3HDO of the SAREX Working Group and NASA Spacelink for the preceding information.
NNNN
/EX

1441. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 23:06:32 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779670392@afit.af.mil>
Source record: 26889

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 64
1 23251U 94059A 94258.03341559 .00002177 10701-4 73754-5 0 215
2 23251 57.0069 200.6040 0010111 266.8489 76.3802 16.06008853 813
1994059B
1 23253U 94059B 94257.91157669 .00076921 13414-4 10754-3 0 42
2 23253 57.0045 201.1786 0010001 276.5519 82.9036 16.05864435 167
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1442. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-09-15 23:06:47 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.779670407@afit.af.mil>
Source record: 26897
Cross-posted to: rec.radio.amateur.space,rec.radio.info

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 64
1 23251U 94059A 94258.03341559 .00002177 10701-4 73754-5 0 215
2 23251 57.0069 200.6040 0010111 266.8489 76.3802 16.06008853 813
1994059B
1 23253U 94059B 94257.91157669 .00076921 13414-4 10754-3 0 42
2 23253 57.0045 201.1786 0010001 276.5519 82.9036 16.05864435 167
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1443. STS-64 Element Set (94259.031)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 00:01:00 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94259.031@alsys.com>
Source record: 26895
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94259.03185091 .00002390 10715-4 74540-5 0 231
2 23251 57.0071 195.8801 0009155 273.4485 86.5562 16.11758113 994

Satellite: STS-64
Catalog number: 23251
Epoch time: 94259.03185091 = (16 SEP 94 00:45:51.91 UTC)
Element set: 023
Inclination: 57.0071 deg
RA of node: 195.8801 deg Space Shuttle Flight STS-64
Eccentricity: .0009155 Keplerian element set JSC-023
Arg of perigee: 273.4485 deg from NASA flight Day 7 vector
Mean anomaly: 86.5562 deg
Mean motion: 16.11758113 rev/day Gil Carman
Decay rate: 2.390e-05 rev/day^2 NASA Johnson Space Center
Epoch rev: 99

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1444. SAREX Rise Set 9/17

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 02:01:48 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.017.1994@ampr.org>
Source record: 26904
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.017
STS-64 Eastern R/S Times 09/17

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of
the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Atlanta GA

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 04:08:58 336 04:12:51 45 18 04:16:26 112 117 07:05:46:03
17Sep94 05:42:01 296 05:45:18 243 10 05:48:54 182 118 07:07:19:06
17Sep94 20:12:16 227 20:16:27 319 47 20:20:20 34 128 07:21:49:21
18Sep94 04:03:36 330 04:07:29 45 31 04:11:22 125 133 08:05:40:41
18Sep94 05:37:15 283 05:39:56 242 5 05:42:38 199 134 08:07:14:20
18Sep94 18:35:38 167 18:38:37 117 7 18:41:37 71 143 08:20:12:43
18Sep94 20:07:12 240 20:11:05 316 24 20:14:58 27 144 08:21:44:17
19Sep94 03:58:08 323 04:02:19 82 64 04:06:12 138 149 09:05:35:13
19Sep94 18:29:34 183 18:32:51 126 13 18:36:26 62 159 09:20:06:39
19Sep94 20:02:01 252 20:05:37 314 14 20:09:12 19 160 09:21:39:06

Miami FL

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 04:11:39 353 04:14:57 49 10 04:18:14 105 117 07:05:48:44
17Sep94 05:44:07 301 05:47:42 238 13 05:50:59 180 118 07:07:21:12
17Sep94 18:39:12 184 18:42:47 117 15 18:46:23 56 127 07:20:16:17
17Sep94 20:12:16 259 20:15:33 315 8 20:18:32 4 128 07:21:49:21
18Sep94 04:05:47 342 04:09:40 52 18 04:13:15 119 133 08:05:42:52
18Sep94 05:39:08 289 05:42:08 243 6 05:45:07 195 134 08:07:16:13
18Sep94 18:33:20 199 18:37:13 124 31 18:41:06 46 143 08:20:10:25

19Sep94 04:00:13 334 04:04:24 61 36 04:08:17 133 149 09:05:37:18
19Sep94 18:27:46 212 18:31:57 72 72 18:35:50 36 159 09:20:04:51

New York NY

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 02:36:25 331 02:40:00 33 14 02:43:35 98 116 07:04:13:30
17Sep94 04:09:10 304 04:13:03 225 24 04:16:39 160 117 07:05:46:15
17Sep94 18:43:30 174 18:46:47 120 8 18:49:46 72 127 07:20:20:35
17Sep94 20:15:03 238 20:19:14 324 35 20:23:07 38 128 07:21:52:08
18Sep94 02:30:51 327 02:34:44 36 21 02:38:38 110 132 08:04:07:56
18Sep94 04:03:55 297 04:07:30 234 14 04:11:05 172 133 08:05:41:00
18Sep94 18:37:38 188 18:41:13 124 14 18:44:48 63 143 08:20:14:43
18Sep94 20:10:05 250 20:13:58 327 22 20:17:52 34 144 08:21:47:10
19Sep94 02:25:36 323 02:29:29 42 34 02:33:22 120 148 09:04:02:41
19Sep94 03:58:39 290 04:01:56 238 8 04:05:13 185 149 09:05:35:44
19Sep94 18:31:46 200 18:35:39 129 24 18:39:33 56 159 09:20:08:51
19Sep94 20:04:50 260 20:08:25 321 15 20:12:18 30 160 09:21:41:55

Washington DC

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 02:36:37 341 02:39:54 35 8 02:42:53 84 116 07:04:13:42
17Sep94 04:08:46 313 04:12:57 225 53 04:16:50 146 117 07:05:45:51
17Sep94 18:43:05 167 18:46:05 118 6 18:48:46 76 127 07:20:20:10
17Sep94 20:14:21 236 20:18:14 305 37 20:22:25 36 128 07:21:51:26
18Sep94 02:30:57 335 02:34:32 34 12 02:38:07 96 132 08:04:08:02
18Sep94 04:03:42 306 04:07:35 228 27 04:11:28 158 133 08:05:40:47
18Sep94 18:37:08 181 18:40:25 124 12 18:44:00 64 143 08:20:14:13
18Sep94 20:09:17 247 20:13:10 324 22 20:17:03 32 144 08:21:46:22
19Sep94 02:25:35 332 02:29:28 45 18 02:33:03 108 148 09:04:02:40
19Sep94 03:58:20 300 04:01:55 239 15 04:05:31 172 149 09:05:35:25
19Sep94 18:31:10 196 18:35:03 122 20 18:38:38 58 159 09:20:08:15
19Sep94 20:04:13 259 20:07:48 324 14 20:11:23 26 160 09:21:41:18

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

SB SAREX @ AMSAT $STS-64.018
STS-64 Central R/S Times 09/17

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Chicago IL

Satellite STS-64
Element Set 21

Date	Rise	Az	Maximum	Az	El	Set	Az	Orb	Rise MET
17Sep94	02:34:37	338	02:37:37	25	6	02:40:36	71	116	07:04:11:42
17Sep94	04:06:47	319	04:10:58	48	47	04:14:51	125	117	07:05:43:52
17Sep94	05:40:26	284	05:43:25	236	7	05:46:25	190	118	07:07:17:31
17Sep94	20:13:51	199	20:17:27	133	22	20:21:20	58	128	07:21:50:56
17Sep94	21:46:37	258	21:50:30	330	16	21:54:05	32	129	07:23:23:42
18Sep94	02:29:04	334	02:32:21	27	8	02:35:38	80	132	08:04:06:09
18Sep94	04:01:31	314	04:05:42	144	76	04:09:35	136	133	08:05:38:36
18Sep94	20:08:18	211	20:12:11	126	40	20:16:04	52	144	08:21:45:23
18Sep94	21:41:39	269	21:45:14	332	12	21:48:31	28	145	08:23:18:44
19Sep94	02:23:30	331	02:27:05	30	11	02:30:40	90	148	09:04:00:35
19Sep94	03:56:15	309	04:00:09	229	44	04:04:02	147	149	09:05:33:20
19Sep94	20:02:44	222	20:06:37	166	79	20:10:48	46	160	09:21:39:49
19Sep94	21:36:41	280	21:39:58	335	9	21:43:16	27	161	09:23:13:46

Denver CO

Satellite STS-64
Element Set 21

Date	Rise	Az	Maximum	Az	El	Set	Az	Orb	Rise MET
17Sep94	04:05:29	343	04:08:28	30	6	04:11:28	76	117	07:05:42:34
17Sep94	05:37:38	318	05:41:49	83	68	05:45:43	134	118	07:07:14:43
17Sep94	21:43:19	220	21:47:31	108	75	21:51:24	45	129	07:23:20:24
17Sep94	23:17:34	280	23:20:34	328	7	23:23:51	20	130	08:00:54:39
18Sep94	03:59:49	338	04:03:06	29	9	04:06:24	84	133	08:05:36:54
18Sep94	05:32:16	312	05:36:10	248	52	05:40:21	146	134	08:07:09:21
18Sep94	21:38:09	231	21:42:02	312	52	21:46:13	40	145	08:23:15:14
19Sep94	03:54:27	335	03:58:02	37	12	04:01:38	97	149	09:05:31:32
19Sep94	05:26:55	306	05:30:48	236	27	05:34:41	158	150	09:07:04:00
19Sep94	20:00:56	177	20:04:13	121	9	20:07:30	68	160	09:21:38:01
19Sep94	21:32:47	242	21:36:40	317	28	21:40:34	34	161	09:23:09:52

Houston TX

Satellite STS-64
Element Set 21

Date	Rise	Az	Maximum	Az	El	Set	Az	Orb	Rise MET
17Sep94	05:40:49	326	05:45:00	61	63	05:48:54	139	118	07:07:17:54
17Sep94	20:10:10	203	20:14:03	127	36	20:17:56	46	128	07:21:47:15

18Sep94 05:35:39 318 05:39:32 240 51 05:43:25 152 134 08:07:12:44
18Sep94 20:04:36 216 20:08:47 33 80 20:12:40 37 144 08:21:41:41
19Sep94 03:58:13 355 04:01:13 43 7 04:04:12 92 149 09:05:35:18
19Sep94 05:30:23 309 05:34:16 231 23 05:37:51 166 150 09:07:07:28
19Sep94 19:59:25 229 20:03:19 311 37 20:07:12 28 160 09:21:36:30

Huntsville AL

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 04:08:40 338 04:12:15 41 16 04:16:08 110 117 07:05:45:45
17Sep94 05:41:25 298 05:45:00 238 13 05:48:36 176 118 07:07:18:30
17Sep94 20:12:16 219 20:16:09 226 80 20:20:20 40 128 07:21:49:21
18Sep94 04:03:00 331 04:06:53 39 26 04:10:46 121 133 08:05:40:05
18Sep94 05:36:39 286 05:39:39 238 7 05:42:38 191 134 08:07:13:44
18Sep94 20:06:54 231 20:10:47 304 39 20:14:58 33 144 08:21:43:59
19Sep94 03:57:38 325 04:01:31 31 51 04:05:42 134 149 09:05:34:43
19Sep94 18:29:40 174 18:32:57 121 9 18:36:15 68 159 09:20:06:45
19Sep94 20:01:50 244 20:05:25 310 22 20:09:18 26 160 09:21:38:55

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

SB SAREX @ AMSAT $STS-64.019
STS-64 Western R/S Times 09/17

Below are the rise and set times for STS-64 for selected US cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

Albuquerque NM

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 05:38:26 333 05:42:19 46 23 05:46:12 118 118 07:07:15:31
17Sep94 07:11:47 290 07:14:46 241 8 07:18:04 187 119 07:08:48:52
17Sep94 21:42:19 226 21:46:13 296 55 21:50:24 36 129 07:23:19:24
18Sep94 05:33:04 326 05:36:57 46 43 05:40:50 130 134 08:07:10:09
18Sep94 20:05:42 165 20:08:23 122 6 20:11:23 74 144 08:21:42:47

18Sep94 21:36:58 237 21:40:51 307 28 21:45:02 30 145 08:23:14:03
19Sep94 05:27:24 320 05:31:35 240 85 05:35:28 142 150 09:07:04:29
19Sep94 19:59:26 183 20:03:01 121 12 20:06:19 64 160 09:21:36:31
19Sep94 21:31:54 250 21:35:29 312 16 21:39:22 23 161 09:23:08:59

Honolulu HI

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 00:43:20 224 00:47:13 297 37 00:51:24 25 115 07:02:20:25
17Sep94 10:12:30 332 10:16:23 56 51 10:20:16 140 121 07:11:49:35
18Sep94 00:38:16 238 00:41:51 302 18 00:45:44 14 131 08:02:15:21
18Sep94 10:06:56 322 10:11:07 220 56 10:15:00 153 137 08:11:44:01
18Sep94 23:00:32 177 23:04:07 116 11 23:07:24 62 145 09:00:37:37
19Sep94 00:33:17 253 00:36:34 307 9 00:39:52 3 147 09:02:10:22
19Sep94 10:01:39 312 10:05:33 240 23 10:09:26 167 153 09:11:38:44
19Sep94 22:54:40 192 22:58:33 119 22 23:02:23 49 161 10:00:31:45

Los Angeles CA

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 05:37:44 354 05:40:43 40 5 05:43:25 80 118 07:07:14:49
17Sep94 07:09:35 317 07:13:46 220 58 07:17:40 148 119 07:08:46:40
17Sep94 21:40:55 193 21:44:31 128 20 21:48:24 54 129 07:23:18:00
17Sep94 23:13:59 260 23:17:34 321 10 23:20:51 16 130 08:00:51:04
18Sep94 05:32:10 348 05:35:27 42 8 05:38:44 94 134 08:07:09:15
18Sep94 07:04:19 310 07:08:12 240 27 07:12:05 161 135 08:08:41:24
18Sep94 21:35:21 206 21:39:14 122 40 21:43:07 46 145 08:23:12:26
18Sep94 23:09:18 275 23:12:17 323 6 23:15:17 9 146 09:00:46:23
19Sep94 05:26:35 341 05:30:10 46 14 05:33:46 106 150 09:07:03:40
19Sep94 06:59:03 302 07:02:56 234 15 07:06:31 173 151 09:08:36:08
19Sep94 21:29:53 219 21:33:46 337 86 21:37:57 39 161 09:23:06:58

Seattle WA

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 00:53:30 256 00:57:23 332 27 01:01:16 46 115 07:02:30:35
17Sep94 02:27:27 296 02:30:44 349 10 02:34:19 48 116 07:04:04:32
17Sep94 04:01:06 314 04:04:41 16 11 04:07:59 70 117 07:05:38:11
17Sep94 05:33:51 311 05:38:03 42 38 05:41:56 113 118 07:07:10:56
17Sep94 07:06:55 292 07:10:30 231 14 07:14:05 168 119 07:08:44:00
17Sep94 23:15:11 215 23:19:04 145 35 23:23:15 58 130 08:00:52:16
18Sep94 00:48:14 264 00:52:07 336 20 00:56:00 46 131 08:02:25:19
18Sep94 02:22:11 300 02:25:46 358 9 02:29:04 50 132 08:03:59:16
18Sep94 03:55:50 316 03:59:26 18 13 04:03:01 78 133 08:05:32:55

18Sep94 05:28:36 309 05:32:29 16 61 05:36:40 122 134 08:07:05:41
18Sep94 07:01:39 287 07:04:56 235 9 07:08:14 180 135 08:08:38:44
18Sep94 23:09:37 225 23:13:48 135 62 23:17:59 55 146 09:00:46:42
19Sep94 00:42:59 272 00:46:52 339 16 00:50:45 46 147 09:02:20:04
19Sep94 02:17:13 306 02:20:31 0 9 02:23:48 53 148 09:03:54:18
19Sep94 03:50:17 314 03:54:10 22 15 03:57:45 84 149 09:05:27:22
19Sep94 05:23:02 306 05:27:13 217 78 05:31:24 132 150 09:07:00:07
19Sep94 06:56:41 279 06:59:23 238 5 07:02:04 196 151 09:08:33:46
19Sep94 21:33:06 173 21:36:05 124 7 21:39:05 77 161 09:23:10:11
19Sep94 23:04:22 234 23:08:15 282 72 23:12:31 52 162 10:00:41:27

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

SB SAREX @ AMSAT $STS-64.020
STS-64 World R/S Times 09/17

Below are the rise and set times for STS-64 for selected cities
over the next three days. This data was generated to help hams without
orbit programs to participate in the SAREX activities. Please note
that all times are in UTC.

Rise= time (HH:MM:SS) the Shuttle Orbiter appears at the horizon
Az= Azimuth (true) where the Orbiter will rise.
Maximum= time, azimuth (Az), and elevation (El) of the highest part of the pass
Set= time and azimuth when the Shuttle descends below the horizon
Orb= the number of this orbit
Rise MET= The Mission Elapsed Time at the rise. Format is DD:HH:MM:SS

London UK

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 15:48:44 223 15:52:55 134 40 15:56:49 63 125 07:17:25:49
17Sep94 17:21:48 266 17:25:41 342 30 17:29:34 59 126 07:18:58:53
17Sep94 18:55:09 293 18:59:02 5 20 19:02:55 74 127 07:20:32:14
17Sep94 20:28:12 301 20:32:05 12 44 20:36:16 106 128 07:22:05:17
17Sep94 22:00:57 293 22:04:51 225 21 22:08:44 152 129 07:23:38:02
18Sep94 14:12:07 176 14:15:06 129 7 14:18:06 81 140 08:15:49:12
18Sep94 15:43:23 232 15:47:34 120 61 15:51:27 62 141 08:17:20:28
18Sep94 17:16:26 272 17:20:19 342 25 17:24:30 62 142 08:18:53:31
18Sep94 18:49:47 295 18:53:40 5 21 18:57:33 78 143 08:20:26:52
18Sep94 20:22:50 301 20:27:01 53 60 20:30:54 114 144 08:21:59:55
18Sep94 21:55:53 288 21:59:29 224 14 22:03:04 163 145 08:23:32:58
19Sep94 14:06:09 189 14:09:26 135 11 14:13:02 75 156 09:15:43:14
19Sep94 15:38:01 240 15:41:54 267 77 15:46:05 60 157 09:17:15:06
19Sep94 17:11:04 277 17:14:57 344 22 17:19:08 63 158 09:18:48:09
19Sep94 18:44:25 297 18:48:18 5 23 18:52:29 84 159 09:20:21:30

19Sep94 20:17:28 300 20:21:21 292 78 20:25:32 122 160 09:21:54:33
19Sep94 21:50:32 284 21:53:49 231 10 21:57:06 175 161 09:23:27:37

Paris France

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 14:17:11 179 14:20:28 124 8 14:23:27 77 124 07:15:54:16
17Sep94 15:48:44 236 15:52:38 282 77 15:56:49 54 125 07:17:25:49
17Sep94 17:22:06 278 17:25:59 348 16 17:29:34 50 126 07:18:59:11
17Sep94 18:55:45 304 18:59:20 2 12 19:02:55 65 127 07:20:32:50
17Sep94 20:28:48 309 20:32:59 33 28 20:36:52 102 128 07:22:05:53
17Sep94 22:01:51 297 22:05:44 220 25 22:09:38 151 129 07:23:38:56
18Sep94 14:11:13 192 14:14:48 131 13 14:18:23 70 140 08:15:48:18
18Sep94 15:43:23 245 15:47:16 316 49 15:51:27 52 141 08:17:20:28
18Sep94 17:17:02 285 17:20:37 348 14 17:24:12 51 142 08:18:54:07
18Sep94 18:50:41 308 18:54:16 11 13 18:57:51 71 143 08:20:27:46
18Sep94 20:23:26 308 20:27:37 35 39 20:31:30 110 144 08:22:00:31
18Sep94 21:56:29 293 22:00:05 231 17 22:03:58 161 145 08:23:33:34
19Sep94 14:05:33 202 14:09:26 130 19 14:13:02 66 156 09:15:42:38
19Sep94 15:38:01 253 15:41:54 324 34 15:46:05 51 157 09:17:15:06
19Sep94 17:11:40 290 17:15:15 348 13 17:19:08 55 158 09:18:48:45
19Sep94 18:45:19 309 18:48:54 11 15 18:52:47 78 159 09:20:22:24
19Sep94 20:18:04 307 20:22:15 44 58 20:26:08 118 160 09:21:55:09
19Sep94 21:51:07 289 21:54:43 230 11 21:58:00 174 161 09:23:28:12

Sydney Australia

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 00:24:48 201 00:28:24 140 15 00:32:17 70 114 07:02:01:53
17Sep94 01:57:34 241 02:01:09 300 12 02:04:44 2 115 07:03:34:39
17Sep94 16:28:06 317 16:32:17 204 61 16:36:10 144 125 07:18:05:11
18Sep94 00:19:26 207 00:23:20 129 26 00:27:13 58 130 08:01:56:31
18Sep94 01:52:48 253 01:55:47 301 6 01:58:46 347 131 08:03:29:53
18Sep94 14:51:28 16 14:54:28 63 6 14:57:09 104 140 08:16:28:33
18Sep94 16:22:44 305 16:26:55 220 30 16:30:48 150 141 08:17:59:49
19Sep94 00:13:47 215 00:17:58 121 52 00:21:51 46 146 09:01:50:52
19Sep94 14:45:31 2 14:48:48 58 11 14:52:05 115 156 09:16:22:36
19Sep94 16:17:40 293 16:21:33 221 17 16:25:08 158 157 09:17:54:45

Tokyo Japan

Satellite STS-64
Element Set 21

Date Rise Az Maximum Az El Set Az Orb Rise MET
17Sep94 05:15:55 213 05:20:06 110 58 05:23:59 44 118 07:06:53:00
17Sep94 06:50:10 279 06:53:09 326 6 06:56:08 11 119 07:08:27:15

17Sep94 13:06:21 330 13:10:15 39 26 13:14:08 120 123 07:14:43:26
17Sep94 14:39:43 290 14:43:00 237 8 14:45:59 189 124 07:16:16:48
18Sep94 05:10:33 225 05:14:44 333 59 05:18:37 37 134 08:06:47:38
18Sep94 13:01:00 324 13:05:11 65 49 13:09:04 132 139 08:14:38:05
19Sep94 03:33:55 166 03:36:55 117 6 03:39:36 75 149 09:05:11:00
19Sep94 05:05:11 236 05:09:22 321 30 05:13:15 31 150 09:06:42:16
19Sep94 11:23:46 353 11:26:28 35 5 11:29:09 77 154 09:13:00:51
19Sep94 12:55:38 318 12:59:31 265 70 13:03:42 144 155 09:14:32:43

Compiled by Will Marchant, KC6ROL
Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group
Send comments to kc6rol@amsat.org
/EX

1445. SAREX Keps 9/16 at 6:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 02:11:01 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.021.1994@ampr.org>
Source record: 26811
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB SAREX @ AMSAT $STS-64.021
SAREX Keps 9/16 at 06:00 UTC

Silver Spring, MD September 16, 1994 at 06:00 UTC

The following represents the latest Keplerian Elements as
generated by Gil Carman, WA5NOM, at the Johnson Space Center.

STS-64
1 23251U 94059A 94259.03185091 .00002390 10715-4 74540-5 0 231
2 23251 57.0071 195.8801 0009155 273.4485 86.5562 16.11758113 994

Satellite: STS-64
Catalog number: 23251
Epoch time: 94259.03185091 = (16 SEP 94 00:45:51.91 UTC)
Element set: 023
Inclination: 57.0071 deg
RA of node: 195.8801 deg Space Shuttle Flight STS-64
Eccentricity: .0009155 Keplerian element set JSC-023
Arg of perigee: 273.4485 deg from NASA flight Day 7 vector
Mean anomaly: 86.5562 deg
Mean motion: 16.11758113 rev/day Gil Carman
Decay rate: 2.390e-05 rev/day^2 NASA Johnson Space Center
Epoch rev: 99
Checksum: 296

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX
```

1446. ORBS$259.1OF2.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 04:22:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-259.o.1994@ampr.org>
Source record: 26908
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-259.O
Orbital Elements 259.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX September 16, 1994
BID: $ORBS-259.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94252.59439904
Element set: 307
Inclination: 26.9025 deg
RA of node: 308.7787 deg
Eccentricity: 0.6028348
Arg of perigee: 209.6025 deg
Mean anomaly: 95.4428 deg
Mean motion: 2.05882336 rev/day
Decay rate: -2.93e-06 rev/day^2
Epoch rev: 8452
Checksum: 325

Satellite: UO-11
Catalog number: 14781
Epoch time: 94255.06182888
Element set: 730
Inclination: 97.7855 deg
RA of node: 265.7184 deg
Eccentricity: 0.0012087
Arg of perigee: 357.6882 deg
Mean anomaly: 2.4263 deg
Mean motion: 14.69244355 rev/day
Decay rate: 1.56e-06 rev/day^2
Epoch rev: 56306
Checksum: 332

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94255.05059726
Element set: 956
Inclination: 82.9201 deg
RA of node: 264.6344 deg
Eccentricity: 0.0012653
Arg of perigee: 136.9370 deg
```

Mean anomaly: 223.2773 deg
Mean motion: 13.72341359 rev/day
Decay rate: 3.6e-07 rev/day^2
Epoch rev: 36182
Checksum: 304

Satellite: AO-13
Catalog number: 19216
Epoch time: 94255.03141595
Element set: 963
Inclination: 57.7390 deg
RA of node: 231.5483 deg
Eccentricity: 0.7231710
Arg of perigee: 350.0805 deg
Mean anomaly: 0.9547 deg
Mean motion: 2.09725791 rev/day
Decay rate: -3.41e-06 rev/day^2
Epoch rev: 4783
Checksum: 301

Satellite: FO-20
Catalog number: 20480
Epoch time: 94252.88655732
Element set: 724
Inclination: 99.0508 deg
RA of node: 28.7556 deg
Eccentricity: 0.0541353
Arg of perigee: 147.5974 deg
Mean anomaly: 215.9600 deg
Mean motion: 12.83227822 rev/day
Decay rate: -1.5e-07 rev/day^2
Epoch rev: 21499
Checksum: 320

Satellite: AO-21
Catalog number: 21087
Epoch time: 94257.56810328
Element set: 512
Inclination: 82.9382 deg
RA of node: 76.5648 deg
Eccentricity: 0.0034570
Arg of perigee: 192.8788 deg
Mean anomaly: 167.1488 deg
Mean motion: 13.74544297 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 18186
Checksum: 348

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94256.63978862

Element set: 729
Inclination: 82.9235 deg
RA of node: 305.8575 deg
Eccentricity: 0.0027867
Arg of perigee: 220.4418 deg
Mean anomaly: 139.4667 deg
Mean motion: 13.74046259 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 18079
Checksum: 357

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94243.05287604
Element set: 275
Inclination: 2.0332 deg
RA of node: 96.0279 deg
Eccentricity: 0.2914017
Arg of perigee: 190.0489 deg
Mean anomaly: 163.3275 deg
Mean motion: 1.42202991 rev/day
Decay rate: -1.07e-06 rev/day^2
Epoch rev: 226
Checksum: 270

/EX
SB KEPS @ AMSAT $ORBS-259.D
Orbital Elements 259.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX September 16, 1994
BID: $ORBS-259.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94256.18653784
Element set: 30
Inclination: 98.5873 deg
RA of node: 339.7558 deg
Eccentricity: 0.0010573
Arg of perigee: 296.4939 deg
Mean anomaly: 63.5161 deg
Mean motion: 14.29854833 rev/day
Decay rate: 3.2e-07 rev/day^2
Epoch rev: 24216
Checksum: 330

Satellite: AO-16
Catalog number: 20439
Epoch time: 94256.72861379
Element set: 828

Inclination: 98.5962 deg
RA of node: 341.6195 deg
Eccentricity: 0.0010931
Arg of perigee: 295.7954 deg
Mean anomaly: 64.2096 deg
Mean motion: 14.29908822 rev/day
Decay rate: 3.3e-07 rev/day^2
Epoch rev: 24225
Checksum: 339

Satellite: DO-17
Catalog number: 20440
Epoch time: 94256.25450168
Element set: 829
Inclination: 98.5969 deg
RA of node: 341.5049 deg
Eccentricity: 0.0010807
Arg of perigee: 295.8191 deg
Mean anomaly: 64.1875 deg
Mean motion: 14.30048524 rev/day
Decay rate: 4.1e-07 rev/day^2
Epoch rev: 24220
Checksum: 305

Satellite: WO-18
Catalog number: 20441
Epoch time: 94256.72120652
Element set: 831
Inclination: 98.5965 deg
RA of node: 341.9601 deg
Eccentricity: 0.0011533
Arg of perigee: 295.2780 deg
Mean anomaly: 64.7209 deg
Mean motion: 14.30022420 rev/day
Decay rate: 2.0e-07 rev/day^2
Epoch rev: 24227
Checksum: 271

Satellite: LO-19
Catalog number: 20442
Epoch time: 94252.77540811
Element set: 826
Inclination: 98.5978 deg
RA of node: 338.3434 deg
Eccentricity: 0.0011998
Arg of perigee: 306.9748 deg
Mean anomaly: 53.0335 deg
Mean motion: 14.30119048 rev/day
Decay rate: 9.0e-08 rev/day^2
Epoch rev: 24172
Checksum: 319

Satellite: UO-22
Catalog number: 21575
Epoch time: 94256.22189981
Element set: 533
Inclination: 98.4285 deg
RA of node: 328.9113 deg
Eccentricity: 0.0008458
Arg of perigee: 32.3799 deg
Mean anomaly: 327.7902 deg
Mean motion: 14.36931169 rev/day
Decay rate: 5.5e-07 rev/day^2
Epoch rev: 16572
Checksum: 337

Satellite: KO-23
Catalog number: 22077
Epoch time: 94256.02060840
Element set: 426
Inclination: 66.0831 deg
RA of node: 96.0859 deg
Eccentricity: 0.0015366
Arg of perigee: 267.3404 deg
Mean anomaly: 92.5856 deg
Mean motion: 12.86287005 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9808
Checksum: 310

Satellite: AO-27
Catalog number: 22825
Epoch time: 94256.75478020
Element set: 326
Inclination: 98.6474 deg
RA of node: 331.6469 deg
Eccentricity: 0.0008523
Arg of perigee: 316.8301 deg
Mean anomaly: 43.2207 deg
Mean motion: 14.27634167 rev/day
Decay rate: 2.7e-07 rev/day^2
Epoch rev: 5032
Checksum: 297

Satellite: IO-26
Catalog number: 22826
Epoch time: 94256.23874288
Element set: 324
Inclination: 98.6482 deg
RA of node: 331.1882 deg
Eccentricity: 0.0009071
Arg of perigee: 318.6418 deg
Mean anomaly: 41.4073 deg
Mean motion: 14.27738766 rev/day

```
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 5025
Checksum: 314

Satellite: KO-25
Catalog number: 22830
Epoch time: 94256.71982330
Element set: 331
Inclination: 98.5473 deg
RA of node: 327.9662 deg
Eccentricity: 0.0010822
Arg of perigee: 279.6321 deg
Mean anomaly: 80.3637 deg
Mean motion: 14.28063011 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 5033
Checksum: 285

Satellite: 22828
Catalog number: 22828
Epoch time: 94252.72559872
Element set: 302
Inclination: 98.6426 deg
RA of node: 327.7279 deg
Eccentricity: 0.0010011
Arg of perigee: 313.8817 deg
Mean anomaly: 46.1535 deg
Mean motion: 14.28064960 rev/day
Decay rate: 8.0e-08 rev/day^2
Epoch rev: 1784
Checksum: 325

/EX
```

1447. ORBS$259.2OF2.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 04:24:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-259.w.1994@ampr.org>
Source record: 26901
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-259.W
Orbital Elements 259.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX September 16, 1994
BID: $ORBS-259.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94257.84845830
Element set: 954
Inclination: 99.0428 deg
RA of node: 309.3477 deg
Eccentricity: 0.0014992
Arg of perigee: 330.4925 deg
Mean anomaly: 29.5400 deg
Mean motion: 14.13642112 rev/day
Decay rate: 6.6e-07 rev/day^2
Epoch rev: 50292
Checksum: 315

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94257.89909308
Element set: 851
Inclination: 98.5109 deg
RA of node: 264.1700 deg
Eccentricity: 0.0014258
Arg of perigee: 67.9309 deg
Mean anomaly: 292.3385 deg
Mean motion: 14.24904641 rev/day
Decay rate: -2.0e-08 rev/day^2
Epoch rev: 41527
Checksum: 326

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94257.83805377
Element set: 398
Inclination: 82.5414 deg
RA of node: 197.2658 deg
Eccentricity: 0.0015782
Arg of perigee: 294.2905 deg
```

Mean anomaly: 65.6602 deg
Mean motion: 13.84721005 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 33476
Checksum: 336

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94254.54322014
Element set: 324
Inclination: 82.5334 deg
RA of node: 262.5696 deg
Eccentricity: 0.0019985
Arg of perigee: 49.7129 deg
Mean anomaly: 310.5735 deg
Mean motion: 13.16967947 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29462
Checksum: 323

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94257.85815630
Element set: 771
Inclination: 99.1805 deg
RA of node: 249.0011 deg
Eccentricity: 0.0011042
Arg of perigee: 241.6532 deg
Mean anomaly: 118.3512 deg
Mean motion: 14.13015678 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 30780
Checksum: 278

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94255.02533406
Element set: 325
Inclination: 82.5159 deg
RA of node: 74.6874 deg
Eccentricity: 0.0014611
Arg of perigee: 349.1081 deg
Mean anomaly: 10.9756 deg
Mean motion: 13.84371939 rev/day
Decay rate: 2.9e-07 rev/day^2
Epoch rev: 27970
Checksum: 321

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94258.12687846

Element set: 142
Inclination: 82.5523 deg
RA of node: 207.7831 deg
Eccentricity: 0.0007106
Arg of perigee: 72.5262 deg
Mean anomaly: 287.6616 deg
Mean motion: 13.04422462 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23462
Checksum: 284

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94256.20293591
Element set: 828
Inclination: 82.5479 deg
RA of node: 138.5756 deg
Eccentricity: 0.0014481
Arg of perigee: 261.3222 deg
Mean anomaly: 98.6297 deg
Mean motion: 13.84182199 rev/day
Decay rate: 2.0e-08 rev/day^2
Epoch rev: 21279
Checksum: 330

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94257.79387177
Element set: 86
Inclination: 98.8256 deg
RA of node: 275.0575 deg
Eccentricity: 0.0016306
Arg of perigee: 121.8026 deg
Mean anomaly: 238.4860 deg
Mean motion: 14.01334183 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 20625
Checksum: 318

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94257.98215621
Element set: 837
Inclination: 82.5203 deg
RA of node: 74.5360 deg
Eccentricity: 0.0013544
Arg of perigee: 150.5734 deg
Mean anomaly: 209.6189 deg
Mean motion: 13.83588783 rev/day
Decay rate: 1.5e-07 rev/day^2
Epoch rev: 20017

Checksum: 304

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94256.10338615
Element set: 735
Inclination: 82.5390 deg
RA of node: 107.4507 deg
Eccentricity: 0.0013397
Arg of perigee: 331.8928 deg
Mean anomaly: 28.1470 deg
Mean motion: 13.16464319 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16292
Checksum: 289

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94257.80960141
Element set: 180
Inclination: 98.6114 deg
RA of node: 283.5903 deg
Eccentricity: 0.0013050
Arg of perigee: 341.3322 deg
Mean anomaly: 18.7377 deg
Mean motion: 14.22447217 rev/day
Decay rate: 1.01e-06 rev/day^2
Epoch rev: 17324
Checksum: 264

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94254.97812439
Element set: 740
Inclination: 82.5461 deg
RA of node: 55.4385 deg
Eccentricity: 0.0013599
Arg of perigee: 345.4771 deg
Mean anomaly: 14.5955 deg
Mean motion: 13.16833558 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14788
Checksum: 336

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94256.19645572
Element set: 336
Inclination: 82.5492 deg
RA of node: 136.7087 deg
Eccentricity: 0.0023468

Arg of perigee: 343.1815 deg
Mean anomaly: 16.8563 deg
Mean motion: 13.83014610 rev/day
Decay rate: 7.0e-08 rev/day^2
Epoch rev: 5225
Checksum: 302

/EX
SB KEPS @ AMSAT $ORBS-259.M
Orbital Elements 259.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX September 16, 1994
BID: $ORBS-259.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94252.73268152
Element set: 317
Inclination: 98.6449 deg
RA of node: 327.7537 deg
Eccentricity: 0.0009768
Arg of perigee: 314.2350 deg
Mean anomaly: 45.8028 deg
Mean motion: 14.28039306 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 4976
Checksum: 321

Satellite: MIR
Catalog number: 16609
Epoch time: 94258.20132585
Element set: 760
Inclination: 51.6475 deg
RA of node: 96.0036 deg
Eccentricity: 0.0002326
Arg of perigee: 32.7325 deg
Mean anomaly: 327.3803 deg
Mean motion: 15.57072087 rev/day
Decay rate: 1.1449e-04 rev/day^2
Epoch rev: 49004
Checksum: 287

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94257.53621302
Element set: 535
Inclination: 28.4700 deg
RA of node: 22.0113 deg
Eccentricity: 0.0005836
Arg of perigee: 303.4953 deg

Mean anomaly: 56.5074 deg
Mean motion: 14.90673511 rev/day
Decay rate: 6.34e-06 rev/day^2
Epoch rev: 4273
Checksum: 258

Satellite: GRO
Catalog number: 21225
Epoch time: 94252.65438587
Element set: 138
Inclination: 28.4641 deg
RA of node: 5.6223 deg
Eccentricity: 0.0003737
Arg of perigee: 93.8816 deg
Mean anomaly: 266.2210 deg
Mean motion: 15.41231043 rev/day
Decay rate: 3.008e-05 rev/day^2
Epoch rev: 6998
Checksum: 284

Satellite: UARS
Catalog number: 21701
Epoch time: 94258.22624635
Element set: 590
Inclination: 56.9863 deg
RA of node: 158.2439 deg
Eccentricity: 0.0004476
Arg of perigee: 99.4932 deg
Mean anomaly: 260.6616 deg
Mean motion: 14.96419398 rev/day
Decay rate: -1.436e-05 rev/day^2
Epoch rev: 16441
Checksum: 329

/EX

1448. ORBS$259.2L.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 04:25:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-259.n.1994@ampr.org>
Source record: 26900
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-259.N
2Line Orbital Elements 259.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX September 16, 1994
BID: $ORBS-259.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94252.59439904 -.00000293 00000-0 10000-3 0 3078
2 14129 26.9025 308.7787 6028348 209.6025 95.4428 2.05882336 84526
UO-11
1 14781U 84021B 94255.06182888 .00000156 00000-0 34292-4 0 7301
2 14781 97.7855 265.7184 0012087 357.6882 2.4263 14.69244355563064
RS-10/11
1 18129U 87054A 94255.05059726 .00000036 00000-0 23254-4 0 9566
2 18129 82.9201 264.6344 0012653 136.9370 223.2773 13.72341359361824
AO-13
1 19216U 88051B 94255.03141595 -.00000341 00000-0 10000-4 0 9639
2 19216 57.7390 231.5483 7231710 350.0805 0.9547 2.09725791 47839
FO-20
1 20480U 90013C 94252.88655732 -.00000015 00000-0 32455-4 0 7249
2 20480 99.0508 28.7556 0541353 147.5974 215.9600 12.83227822214993
AO-21
1 21087U 91006A 94257.56810328 .00000094 00000-0 82657-4 0 5120
2 21087 82.9382 76.5648 0034570 192.8788 167.1488 13.74544297181865
RS-12/13
1 21089U 91007A 94256.63978862 .00000047 00000-0 33560-4 0 7295
2 21089 82.9235 305.8575 0027867 220.4418 139.4667 13.74046259180797
ARSENE
1 22654U 93031B 94243.05287604 -.00000107 00000-0 00000 0 0 2754
2 22654 2.0332 96.0279 2914017 190.0489 163.3275 1.42202991 2266
UO-14
1 20437U 90005B 94256.18653784 .00000032 00000-0 29486-4 0 302
2 20437 98.5873 339.7558 0010573 296.4939 63.5161 14.29854833242160
AO-16
1 20439U 90005D 94256.72861379 .00000033 00000-0 29686-4 0 8283
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2 20439 98.5962 341.6195 0010931 295.7954 64.2096 14.29908822242250
DO-17
1 20440U 90005E 94256.25450168 .00000041 00000-0 32815-4 0 8291
2 20440 98.5969 341.5049 0010807 295.8191 64.1875 14.30048524242207
WO-18
1 20441U 90005F 94256.72120652 .00000020 00000-0 24631-4 0 8313
2 20441 98.5965 341.9601 0011533 295.2780 64.7209 14.30022420242278
LO-19
1 20442U 90005G 94252.77540811 .00000009 00000-0 20554-4 0 8269
2 20442 98.5978 338.3434 0011998 306.9748 53.0335 14.30119048241729
UO-22
1 21575U 91050B 94256.22189981 .00000055 00000-0 33203-4 0 5330
2 21575 98.4285 328.9113 0008458 32.3799 327.7902 14.36931169165727
KO-23
1 22077U 92052B 94256.02060840 -.00000037 00000-0 10000-3 0 4262
2 22077 66.0831 96.0859 0015366 267.3404 92.5856 12.86287005 98087
AO-27
1 22825U 93061C 94256.75478020 .00000027 00000-0 28788-4 0 3267
2 22825 98.6474 331.6469 0008523 316.8301 43.2207 14.27634167 50320
IO-26
1 22826U 93061D 94256.23874288 .00000014 00000-0 23555-4 0 3248
2 22826 98.6482 331.1882 0009071 318.6418 41.4073 14.27738766 50255
KO-25
1 22830U 93061H 94256.71982330 .00000035 00000-0 31384-4 0 3314
2 22830 98.5473 327.9662 0010822 279.6321 80.3637 14.28063011 50335
22828
1 22828U 93061F 94252.72559872 .00000008 00000-0 20933-4 0 3025
2 22828 98.6426 327.7279 0010011 313.8817 46.1535 14.28064960 17844
NOAA-9
1 15427U 84123A 94257.84845830 .00000066 00000-0 59069-4 0 9540
2 15427 99.0428 309.3477 0014992 330.4925 29.5400 14.13642112502920
NOAA-10
1 16969U 86073A 94257.89909308 -.00000002 00000-0 17464-4 0 8514
2 16969 98.5109 264.1700 0014258 67.9309 292.3385 14.24904641415275
MET-2/17
1 18820U 88005A 94257.83805377 .00000049 00000-0 30087-4 0 3986
2 18820 82.5414 197.2658 0015782 294.2905 65.6602 13.84721005334766
MET-3/2
1 19336U 88064A 94254.54322014 .00000051 00000-0 10000-3 0 3245
2 19336 82.5334 262.5696 0019985 49.7129 310.5735 13.16967947294629
NOAA-11
1 19531U 88089A 94257.85815630 .00000049 00000-0 51560-4 0 7717
2 19531 99.1805 249.0011 0011042 241.6532 118.3512 14.13015678307806
MET-2/18
1 19851U 89018A 94255.02533406 .00000029 00000-0 12782-4 0 3256
2 19851 82.5159 74.6874 0014611 349.1081 10.9756 13.84371939279702
MET-3/3
1 20305U 89086A 94258.12687846 .00000044 00000-0 10000-3 0 1423
2 20305 82.5523 207.7831 0007106 72.5262 287.6616 13.04422462234624
MET-2/19
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1 20670U 90057A 94256.20293591 .00000002 00000-0 -11063-4 0 8282
2 20670 82.5479 138.5756 0014481 261.3222 98.6297 13.84182199212791
FY-1/2
1 20788U 90081A 94257.79387177 -.00000027 00000-0 10000-4 0 861
2 20788 98.8256 275.0575 0016306 121.8026 238.4860 14.01334183206256
MET-2/20
1 20826U 90086A 94257.98215621 .00000015 00000-0 -18705-6 0 8377
2 20826 82.5203 74.5360 0013544 150.5734 209.6189 13.83588783200176
MET-3/4
1 21232U 91030A 94256.10338615 .00000050 00000-0 10000-3 0 7353
2 21232 82.5390 107.4507 0013397 331.8928 28.1470 13.16464319162920
NOAA-12
1 21263U 91032A 94257.80960141 .00000101 00000-0 64416-4 0 1804
2 21263 98.6114 283.5903 0013050 341.3322 18.7377 14.22447217173246
MET-3/5
1 21655U 91056A 94254.97812439 .00000051 00000-0 10000-3 0 7401
2 21655 82.5461 55.4385 0013599 345.4771 14.5955 13.16833558147885
MET-2/21
1 22782U 93055A 94256.19645572 .00000007 00000-0 -67996-5 0 3363
2 22782 82.5492 136.7087 0023468 343.1815 16.8563 13.83014610 52253
POSAT
1 22829U 93061G 94252.73268152 .00000028 00000-0 28925-4 0 3172
2 22829 98.6449 327.7537 0009768 314.2350 45.8028 14.28039306 49766
MIR
1 16609U 86017A 94258.20132585 .00011449 00000-0 16164-3 0 7604
2 16609 51.6475 96.0036 0002326 32.7325 327.3803 15.57072087490046
HUBBLE
1 20580U 90037B 94257.53621302 .00000634 00000-0 47968-4 0 5350
2 20580 28.4700 22.0113 0005836 303.4953 56.5074 14.90673511 42736
GRO
1 21225U 91027B 94252.65438587 .00003008 00000-0 64115-4 0 1386
2 21225 28.4641 5.6223 0003737 93.8816 266.2210 15.41231043 69987
UARS
1 21701U 91063B 94258.22624635 -.00001436 00000-0 -10462-3 0 5907
2 21701 56.9863 158.2439 0004476 99.4932 260.6616 14.96419398164416
/EX
```

1449. Re: SAREX Status/Keps 9/12 at 11:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 08:08:24 UTC
From: smiller@intelsun.rus.uni-stuttgart.de
Message-ID: <35bjpo$119g@info2.rus.uni-stuttgart.de>
Source record: 26893

Thomas A. Boza~ (tboza@sedona.intel.com) wrote:

: I heard Susan, KB5IWS, from STS-64 on 145.55 last night making two
: differnet QSOs.

: She did not call CQ, and From what I understand, "YOU" have to call CQ,
: and they (Susan) will answer you.

I've heard two of the men on board. I thought they'd always use
the KB5SIW call, but I also heard them use one of the other callsigns
once. Since liftoff, I've had no problems hearing them (a total of
eight times, every evening (German time) except last night when I had
to work late ;-(Twice they even called CQ -- not too surprising
given the fact that the probably don't work too many hams in the Atlantic
ocean. Anyway, once they heard (and phonetically repeated) the last
three letters of my call, but beyond that I've not had any success
working them with my vertical (!).

They've always been on voice -- and NEVER on packet yet that I've heard.
Now I see in the latest ARRL bulletin that they have packet turned off in
order to save power, but might turn it on later in the mission. I hope
so. At least then I won't have to guess which uplink freq. they're using!

73,

--Shannon, DL6SEU/N7APC

1450. STS-64 ATL Update #2

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 12:09:01 UTC
From: tstader@si.tiac.net
Message-ID: <tstader-1609940809010001@si.tiac.net>
Source record: 26909

MacSPOC v1.5 Users-

The enclosed attitude time line (ATL) was just downloaded from the SAREX Quadra 800 in Mission Control. It reflects Thursday evening CDT planning and is a StuffIt archive packed as BinHex bytes.

-Dan Adamo

```
===============
File: ATL
===============
000/01:12:00.000 -ZLV Nose South LVLH .000 180.000 90.000
000/08:05:00.000 -3 64se South LVLH .000 180.000 90.000
000/21:45:00.000 Bias -YLV Nose North LVLH 275.000 .000 300.000
001/08:00:00.000 HUD Calibration INTL 150.500 334.370 301.670
001/08:30:00.000 -ZLV Nose South LVLH .000 180.000 90.000
001/10:30:00.000 Bias +XLV Bay North GG LVLH 249.170 268.210 358.020
001/16:32:32.000 TRIM 4 LVLH 180.000 355.000 .000
001/17:42:32.000 LITE RUN C D LVLH 90.000 90.000 85.000
002/19:13:11.000 LMT SETUP LVLH .000 215.000 90.000
002/19:16:02.000 LMT (ATLANTIC) LVLH 270.000 301.560 88.160
002/19:20:18.000 SWEEP SETUP LVLH 185.000 .000 .000
002/19:56:26.000 SWEEP MNVR 4 LVLH 185.000 .000 .000
002/21:25:12.000 SWEEP MNVR 1 LVLH 210.000 .000 .000
002/21:26:25.000 SWEEP MNVR 4 LVLH 185.000 .000 .000
002/23:41:54.000 123456789O123456789012 LVLH .000 185.000 270.000
003/01:07:32.000 lite LVLH .000 185.000 270.000
003/01:17:32.000 LMT SETUP LVLH .000 210.000 270.000
003/01:19:28.000 LMT (GULF OF CA) LVLH 270.000 118.190 271.130
003/01:22:09.000 LMT COMPLETE LVLH .000 185.000 270.000
003/03:04:27.000 IMU -Z COAS INTL 113.000 312.000 319.000
003/03:44:40.000 LITE RUN E LVLH 5.000 180.000 .000
003/13:22:23.000 AMOS PRCS-ZERO LVLH 33.600 180.000 .000
003/13:57:31.000 H2O DUMP LVLH .000 180.000 90.000
003/16:00:00.000 Lite LVLH .000 175.000 270.000
003/16:32:36.000 Trim 4 5 LVLH .000 191.000 .000
003/17:57:33.000 PAO event LVLH .000 180.000 90.000
003/22:35:50.000 Spartian deploy INTL 266.170 225.420 8.540
003/23:41:45.000 SEP 3 +X RCS INTL 124.000 11.000 22.000
004/00:26:53.000 LITE LVLH 5.000 180.000 .000
004/03:55:00.000 Lite Cal F LVLH 184.800 .000 .000
004/15:09:10.000 H20 SPLY DUMP LVLH .000 180.000 290.000
004/16:35:54.000 NC2 LVLH .000 191.000 .000
004/18:22:30.000 NPC LVLH 270.110 269.890 79.000
004/19:07:36.000 LITE G LVLH 5.000 180.000 .000
004/19:39:30.000 LITE G (WEST) LVLH 174.270 2.870 29.780
```

```
004/20:18:46.000 LITE G (EAST) LVLH 6.970 175.080 44.680
004/21:10:46.000 LITE G (WEST) LVLH 174.270 2.870 29.780
004/21:52:16.000 LMT SETUP LVLH .000 210.000 90.000
004/21:54:01.000 LMT (PACIFIC) LVLH 270.000 298.720 88.670
004/21:57:12.000 LITE (EAST) LVLH 6.970 175.080 44.680
004/22:46:46.000 LITE G (WEST) LVLH 174.270 2.870 29.780
004/23:22:20.000 LMT SETUP LVLH .000 215.000 90.000
004/23:24:15.000 LMT (PACIFIC) LVLH 270.000 294.860 89.110
004/23:27:00.000 LITE (EAST) LVLH 6.970 175.080 44.680
004/23:40:46.000 LMT SETUP LVLH .000 210.000 90.000
004/23:43:14.000 LMT (LK MITCH) LVLH 270.000 298.050 89.110
004/23:45:44.000 LITE RUN G H LVLH 90.000 90.000 85.000
005/05:10:01.000 LITE H LVLH 90.000 90.000 85.000
005/13:33:00.000 DEPRESS LVLH .000 180.000 .000
005/17:16:54.000 +X RCS NC4 INTL 264.000 75.000 25.000
005/17:24:17.000 -Y TGT TRACK LVLH 90.000 280.000 .000
005/18:18:21.000 RADAR TGT TRACK LVLH 20.000 270.000 .000
005/18:41:40.000 -Z TGT TRACK LVLH .000 270.000 .000

--
Terry Stader - KA8SCP
America Online Ham Radio Club Host
```

1451. STS-64 Checkpoint #7

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 12:09:53 UTC
From: tstader@si.tiac.net
Message-ID: <tstader-1609940809530001@si.tiac.net>
Source record: 26906

MacSPOC Users-

The enclosed checkpoint reflects tracking into Thursday evening CDT, following Discovery's successful rendezvous and retrieval of the SPARTAN satellite. It also includes effects from the HA and CIRC burns lowering Discovery's altitude to 130 nm. No further burns are planned until Monday morning's deorbit to KSC on Orbit 142.

-Dan Adamo

```
===============
File: STS64-7.cp
===============
Orbit 98 Confirmed CIRC Burn at 6/01:14 MET
1994 252 ( 9- 9) 22 22 54.947
1994 259 ( 9-16) 1 0 .000
0.244961154235D+07 0.170272492127D+00
3 99
-0.865892642072D+07 -0.127749463330D+08 0.152789204273D+08
0.226048633252D+05 -0.142005966714D+04 0.116151433154D+05
733.9 225399.1 79.00 2.72
```

--
Terry Stader - KA8SCP
America Online Ham Radio Club Host

1452. Shuttle Audio - Courtesy Tones

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 13:00:17 UTC
From: roman@jethro.sps.mot.com
Message-ID: <1994Sep16.130017.27471@newsgate.sps.mot.com>
Source record: 26812
Cross-posted to: sci.space.shuttle,sci.space.tech,rec.radio.amateur.space

If anyone could post or e-mail the tech. description (frequency(s), duration, etc.) of the "courtesy tones" used by NASA in their Apollo and Shuttle Audio links, I would be sincerely appreciative.

Thanks in advance.

roman robles
roman@jethro.sps.mot.com

1453. Testing this poster

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 14:10:16 UTC
From: jhodgson@p03.az75.honeywell.com
Message-ID: <jhodgson.2.000E2C41@p03.az75.honeywell.com>
Source record: 26910

testing 1-2-3 testing
John Hodgson
jhodgson@p03.az75.honeywell.com
Honeywell, Air Transport Systems Division
Phoenix, Arizona -but it's a dry heat

1454. SAREX Update & Keps 9/16

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 15:51:00 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.022.1994@ampr.org>
Source record: 26902
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.022
SAREX Update & Keps 9/16 19:30 UTC

Silver Spring, MD September 16, 1994 at 19:30 UTC

No SAREX Packet Operations

The SAREX team at mission control learned today that we will not be
able to turn on the SAREX packet system during the STS-64 mission. The
Shuttle Crew hasworked hard to conserve power to allow the Shuttle to stay
up an additional, tenth day. However, the power budget is such that SAREX
packet could not be energized through the Orbiter power without impacting
primary payload operations. We will, however, continue voice operations
using battery power when the shuttle crew is available. The SAREX team has
had many reports of voice QSOs with the shuttle crew on this flight.

Orbital Elements

The following represents the latest Keplerian Elements as generated by
Ron Parise, WA4SIR, at the Goddard Space Flight Center and checked by
Gil Carman, WA5NOM, at the Johnson Space Center.

STS-64
1 23251U 94059A 94259.27989906 0.00005269 10869-4 78459-5 0 268
2 23251 57.0062 194.7051 0009503 278.7996 81.2013 16.11955829 1033

Satellite: STS-64
Catalog number: 23251
Epoch time: 94259.27989906 (16 SEP 94 06:43:03.28 UTC)
Element set: GSFC-026
Inclination: 57.0062 deg
RA of node: 194.7051 deg Space Shuttle Flight STS-64
Eccentricity: 0.0009503 Keplerian Elements
Arg of perigee: 278.7996 deg
Mean anomaly: 81.2013 deg
Mean motion: 16.11955829 rev/day Semi-major Axis: 6619.6156 Km
Decay rate: 0.53E-04 rev/day*2 Apogee Alt: 247.52 Km
Epoch rev: 103 Perigee Alt: 234.94 Km

NOTE - This element set is based on NORAD element set # 026.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1455. BPSK and FM modems

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 15:51:47 UTC
From: ken@sislnews.csc.ti.com
Message-ID: <940916155147@ken_durham.linear.sc.ti.com>
Source record: 26899

What kind of TNC and Modem should be used for the 9600 baud BPSK and 1200 baud PSK and FM birds? Can a single TNC/modem combo be used for both? There has been some discussion of k9ng and g3ruh modems, but nothing to explain if they are both suitable for Satellite packet.

Would someone tell me what you are using for these modes and what you would recommend for a low budget system?

Ken Durham K5MBV durham@lobby.ti.com

1456. * SpaceNews 19-Sep-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 16:57:32 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0919.1994@ampr.org>
Source record: 26905
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0919
* SpaceNews 19-Sep-94 *

BID: $SPC0919

=========
SpaceNews
=========

MONDAY SEPTEMBER 19, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* SAREX SCHOOL CONTACT *
========================
Sal, N9NJF had the pleasure of making a scheduled SAREX contact with Dick, KB5SIW during mission STS-64 on 11-Sep-94 at 23:48 to 23:56 UTC from the Crystal Lake South Elementary School, Crystal Lake, Illinois.

Ed Picha, N9EP reports that the contact went well and solid signals were aquired about 20 seconds after computer-predicted AOS. Six children were chosen to ask questions, and each got to ask 2 questions.

The ground station equipment used to make the contact included a Yaesu FT-736R with Mirage 150 W amp into a KLM-14CX antenna with Landwher preamp mounted on the antenna. A backup configuration consisted of a Motorola SPECTRA, 110 W out to a 5/8 wave vertical antenna at 30 feet.

The antenna was computer controlled with INSTANT TRACK and KC TRACKER. Doppler compensation was accomplished by programming a number of memories in the FT-736 with the appropriate doppler corrected transmit and receive frequencies and switching these memories each minute of the pass. Ed is currently working on some software to perform doppler compensation "automagically" for the FT-736 transceiver, and expects to have it completed shortly.

Ed found that LHCP was superior to RHCP for most of the pass. Some times the difference in received signal strength was as much as 4 S units, even though the antenna in the Shuttle is linearly polarized.

Ed also reports the SAREX contact was a great experience and it was truly rewarding to see the school kids bouncing off the walls when the contact was over. They were REALLY excited!

[Info via Ed Picha, N9EP]

* AMSAT-OSCAR-16 NEWS *
======================
At 0300 UTC on 12-Sep-94, the AO-16 Command Team began to reload the
of the Ramdisk and File Server software on AMSAT-OSCAR-16 after running
without a reload for over 700 days. This "Preventive Maintenance" is
warranted by the accumulation of uncorrectable SEU's (Single Event Upsets)
in the file control structures stored on the ram disk. During the past
year, four uncorrectable SEU's have been recorded in the directory, root
directory and FAT (File Allocation Table) entries of the error logs. In
the past, a crash of the file server software was attributed to these types
of errors. Reloading and running the ram disk software reformats the ram
disk thereby cleaning out all the bad SEU's.

Fortunately these uncorrectable errors have not occurred in the EDAC memory
where the actual spacecraft operational software is run. This allows the
command team to unload and reload a task or tasks with the shortest amount
of file server downtime. The digipeater will be off during this reload and
all stations are requested not to uplink to the satellite during this time.
Thanks in advance for your cooperation.

[Info via Russ Platt, WJ9F, of the AO-16 Command Team]

* LUSAT-OSCAR-19 NEWS *
======================
After a three month period, the file server on the LUSAT-OSCAR-19 satellite
is back in operation. The file server had been out of service since the
spacecraft's on-board computer crashed last May for unknown reasons while
it was over the South Atlantic Anomaly.

An LUSAT command station completed the OBC software reload on Sunday
11-Sep-94 and brought the file server back on line.

[Info via Gustavo, LW2DTZ of AMSAT LU]

* FUJI-OSCAR-20 NEWS *
======================
The FO-20 command team mentioned that digital mode operation of the bird
will be continued for a while because mode switching between digital mode
and analog mode may cause a problem with the onboard command system.

[Info via Kazu Sakamoto, JJ1WTK qga02014@niftyserve.or.jp]

* ITAMSAT-OSCAR-26 NEWS *
========================
After 40 days of idle time, the ITAMSAT spacecraft was switched on by
ground command and a full spacecraft checkout was performed by the control
team. IO-26 was found to be in excellent shape with the battery fully
charged and all critical parameters in a nominal state. Several pieces
of test software were loaded and executed without any problem.

The reason for the delay in bringing IO-26 back on the air was due to the
heavy workload of the control team. Alberto, I2KBD spent some time in
Chile helping the CESAR team, and lightning destroyed the main command
station.

The reload of the IHT code with improved capabilities is scheduled by the end of September to celebrate IO-26's first year in orbit. Until that occurs, expect a few more weeks of idle time.

[Info via Alberto, I2KBD, ITAMSAT Mission Director]

* MIR EVA COVERAGE *
==========
John, G7MIZ, in England reports watching live pictures of the latest extravehicular activity outside the Russian space station Mir on the morning of 13-Sep-94 at 0630 UTC on the COSMOS 2054 satellite, 10,820 MHz, loacted at 15 degrees west longitude. Other noted frequencies were 10,925 MHz, and 11,385 MHz. Peak signal times were 0600 and 1800 UTC.

[Info via John, G7MIZ @ GB7OAR.GBR.EU]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

IK1SLD XE1RK KC2EQ N2AAM N2CBO N2JOC N4WAK AB5IQ
K8EF LU8DYF KF9WW N9EF John Darden Dan Carlisle

...and those I got to speak to on the "Spectrum" radio show last week. The producers reported the telephones never stopped ringing during the broadcast!

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16, LUSAT-OSCAR-19

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1457. St. Louis Area Hams...

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 19:52:56 UTC
From: el124@cleveland.Freenet.Edu
Message-ID: <35ct2o$sbh@usenet.INS.CWRU.Edu>
Source record: 26903

If anyone from the St. Louis area has any information concerning local frequencies that carry the shuttle transmissions, I would really appreciate knowing about it. Thanks in advance...

--
Mike Wilson CFI-ASEL
Spirit of St. Louis, MO
Email: Internet--wilson@sluvca.slu.edu ----------
Compuserve--75163,45

1458. Squint angles using IT

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 21:43:06 UTC
From: tboza@sedona.intel.com
Message-ID: <35d3ha$439@chnews.intel.com>
Source record: 26898

Using InstantTrack V1, it talks about Squint angles for the satellite's antenna pattern. It states that when attitude infomation is added to the element set, that a "squint" angle region will be displayed on the graphical maps for that satellite.

I understand what a "squint" is, its the area where the satellite's antenna is most favorable for communications because of where its pointing at that time.

However now I notice a circle within the main footprint circle for the satellites. Which is the "squint" part of the footprint? How do I know which circle is which?

Tom WB7ASR...

1459. Re: Shuttle Audio - Courtesy Tones

Newsgroup: rec.radio.amateur.space
Date: 1994-09-16 23:57:47 UTC
From: msguzzo@srqa01.jsc.nasa.gov
Message-ID: <msguzzo.47.0017F6E0@srqa01.jsc.nasa.gov>
Source record: 26817
Cross-posted to: sci.space.shuttle,sci.space.tech,rec.radio.amateur.space

In article <1994Sep16.130017.27471@newsgate.sps.mot.com> roman@jethro.sps.mot.com (Roman Robles) writes:
>From: roman@jethro.sps.mot.com (Roman Robles)
>Subject: Shuttle Audio - Courtesy Tones
>Date: Fri, 16 Sep 1994 13:00:17 GMT

>If anyone could post or e-mail the tech. description (frequency(s),
>duration, etc.) of the "courtesy tones" used by NASA in their
>Apollo and Shuttle Audio links, I would be sincerely appreciative.

>Thanks in advance.

>roman robles
>roman@jethro.sps.mot.com

Are you talking about the Quindar beep before every voice transmission?
*****
Michael Guzzo msguzzo@srqa01.jsc.nasa.gov
Email me for the FutureBasic FAQ - available RSN...

1460. STS-64 Element Set (94260.272)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 13:30:54 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94260.272@alsys.com>
Source record: 26813
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94260.27204451 +.00095812 10877-4 11525-3 0 301
2 23251 57.0074 189.9783 0009419 284.3462 75.6578 16.12282233 1194

Satellite: STS-64
Catalog number: 23251
Epoch time: 94260.27204451 (17 SEP 94 06:31:44.65 UTC)
Element set: GSFC-30a
Inclination: 57.0074 deg
RA of node: 189.9783 deg Space Shuttle Flight STS-64
Eccentricity: 0.0009419 Keplerian Elements
Arg of perigee: 284.3462 deg
Mean anomaly: 75.6578 deg
Mean motion: 16.12282233 rev/day Semi-major Axis: 6618.7222 Km
Decay rate: 9.5812E-04 rev/day*2 Apogee Alt: 246.57 Km
Epoch rev: 119 Perigee Alt: 234.10 Km

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1461. Re: Shuttle Audio - Courtesy Tones

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 17:48:31 UTC
From: climatol@gnv.ifas.ufl.edu
Message-ID: <1994Sep17.124831.5373@tower>
Source record: 26818
Cross-posted to: sci.space.shuttle,sci.space.tech,rec.radio.amateur.space

In article <1994Sep16.130017.27471@newsgate.sps.mot.com>, roman@jethro.sps.mot.com (Roman Robles) writes:
> If anyone could post or e-mail the tech. description (frequency(s),
> duration, etc.) of the "courtesy tones" used by NASA in their
> Apollo and Shuttle Audio links, I would be sincerely appreciative.
>
> Thanks in advance.

So would I!

-- Bob Johnson
rejo@gnv.ifas.ufl.edu

1462. SAREX Keps 9/17 at 21:30 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 17:53:58 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.023.1994@ampr.org>
Source record: 26815
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.023
SAREX Keps 9/17 21:30 UTC

Silver Spring, MD September 17, 1994 at 21:30 UTC

The following represents the latest Keplerian Elements as generated by
Ron Parise, WA4SIR, at the Goddard Space Flight Center and modified
to improve the drag term by Gil Carman, WA5NOM, at the Johnson Space Center.

STS-64
1 23251U 94059A 94260.27204451 0.00095812 10877-4 11525-3 0 301
2 23251 57.0074 189.9783 0009419 284.3462 75.6578 16.12282233 1194

Satellite: STS-64
Catalog number: 23251
Epoch time: 94260.27204451 (17 SEP 94 06:31:44.65 UTC)
Element set: GSFC-30a
Inclination: 57.0074 deg
RA of node: 189.9783 deg Space Shuttle Flight STS-64
Eccentricity: 0.0009419 Keplerian Elements
Arg of perigee: 284.3462 deg
Mean anomaly: 75.6578 deg
Mean motion: 16.12282233 rev/day Semi-major Axis: 6618.7222 Km
Decay rate: 9.5812E-04 rev/day*2 Apogee Alt: 246.57 Km
Epoch rev: 119 Perigee Alt: 234.10 Km
Checksum: 305

NOTE - This element set is based on NORAD element set # 030.
The spacecraft has been propagated to the next ascending
node, and the orbit number has been adjusted to bring it
into agreement with the NASA numbering convention.

Submitted by Frank H. Bauer, KA3HDO, for the SAREX Working Group

/EX

1463. SAREX Packet Now Active

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 19:24:48 UTC
From: ABFHB@abacus.gsfc.nasa.gov
Message-ID: <$sts-64.024.1994@ampr.org>
Source record: 26819
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAREX @ AMSAT $STS-64.024
SAREX Packet Now Active

Contrary to yesterday's bulletin regarding packet ops, the SAREX team and the STS-64 Astronauts have been given the go ahead to activate the packet system. SAREX packet is expected to be active from now until SAREX stow (unless the crew is using the SAREX gear for general voice QSOs). Those wishing to work the Discovery astronauts in packet mode are encouraged to listen to the downlink frequency, 145.55 MHz, FIRST before transmitting. Ground based radio amateurs need to transmit on the packet uplink frequency 144.49 MHz to have their packet signals heard on the Shuttle. The SAREX packet callsign is W5RRR-1.

Good luck and enjoy!

Submitted by Frank H. Bauer, KA3HDO for the SAREX Working Group

/EX

1464. Re: Shuttle Audio - Courtesy Tones

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 19:53:48 UTC
From: msguzzo@srqa01.jsc.nasa.gov
Message-ID: <msguzzo.51.0013E5C5@srqa01.jsc.nasa.gov>
Source record: 26816
Cross-posted to: sci.space.shuttle,sci.space.tech,rec.radio.amateur.space

In article <1994Sep17.124831.5373@tower> climatol@gnv.ifas.ufl.edu (Bob Johnson (Climatology Laboratory)) writes:
>From: climatol@gnv.ifas.ufl.edu (Bob Johnson (Climatology Laboratory))
>Subject: Re: Shuttle Audio - Courtesy Tones
>Date: 17 Sep 94 12:48:31 -0500

>In article <1994Sep16.130017.27471@newsgate.sps.mot.com>,
>roman@jethro.sps.mot.com (Roman Robles) writes:
>> If anyone could post or e-mail the tech. description (frequency(s),
>> duration, etc.) of the "courtesy tones" used by NASA in their
>> Apollo and Shuttle Audio links, I would be sincerely appreciative.
>>
>> Thanks in advance.

>So would I!

>-- Bob Johnson
> rejo@gnv.ifas.ufl.edu

From what I can gather, the Quindar tone is a half second, 450 Hz tone generated by the Quindar transmitter in the Houston MCC. A Quindar receiver at a remote site uses this tone as a cue to key and release the transmitter before and after every voice transmission, respectively.
*****
Michael Guzzo msguzzo@srqa01.jsc.nasa.gov
Email me for the FutureBasic FAQ - available RSN...

1465. ARLK040 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 20:33:05 UTC
From: w1aw@arrl.org
Message-ID: <$arlk040.1994@ampr.org>
Source record: 26821
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK040
ARLK040 Keplerian data

ZCZC SK08
QST de W1AW
Keplerian Bulletin 40 ARLK040
From ARRL Headquarters
Newington, CT September 17, 1994
To all radio amateurs

SB KEP ARL ARLK040
ARLK040 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-64
1 23251U 94059A 94259.25000000 .00005269 10869-4 78459-5 0 265
2 23251 57.0062 194.8475 0009505 278.7360 267.6967 16.11955316 1018
AO-10
1 14129U 83058B 94254.05030619 -.00000192 00000-0 10000-3 0 3080
2 14129 26.8972 308.5366 6028238 209.9975 94.5175 2.05881264 56585
RS-10/11
1 18129U 87054A 94259.06060329 .00000027 00000-0 13079-4 0 9577
2 18129 82.9205 261.6689 0012780 126.3312 233.9016 13.72341388362378
UO-11
1 14781U 84021B 94255.06182888 .00000156 00000-0 34292-4 0 7301
2 14781 97.7855 265.7184 0012087 357.6882 2.4263 14.69244355563064
RS-12/13
1 21089U 91007A 94256.63978862 .00000047 00000-0 33560-4 0 7295
2 21089 82.9235 305.8575 0027867 220.4418 139.4667 13.74046259180797
AO-13
1 19216U 88051B 94255.03141595 -.00000341 00000-0 10000-4 0 9639
2 19216 57.7390 231.5483 7231710 350.0805 0.9547 2.09725791 16330
UO-14
1 20437U 90005B 94256.18653784 .00000032 00000-0 29486-4 0 302
2 20437 98.5873 339.7558 0010573 296.4939 63.5161 14.29854833242160
AO-16
1 20439U 90005D 94256.72861379 .00000033 00000-0 29686-4 0 8283
2 20439 98.5962 341.6195 0010931 295.7954 64.2096 14.29908822242250
```

```
DO-17
1 20440U 90005E 94256.25450168 .00000041 00000-0 32815-4 0 8291
2 20440 98.5969 341.5049 0010807 295.8191 64.1875 14.30048524242207
WO-18
1 20441U 90005F 94256.72120652 .00000020 00000-0 24631-4 0 8313
2 20441 98.5965 341.9601 0011533 295.2780 64.7209 14.30022420242278
LO-19
1 20442U 90005G 94252.77540811 .00000009 00000-0 20554-4 0 8269
2 20442 98.5978 338.3434 0011998 306.9748 53.0335 14.30119048241729
FO-20
1 20480U 90013C 94252.88655732 -.00000015 00000-0 32455-4 0 7249
2 20480 99.0508 28.7556 0541353 147.5974 215.9600 12.83227822214993
AO-21
1 21087U 91006A 94257.56810328 .00000094 00000-0 82657-4 0 5120
2 21087 82.9382 76.5648 0034570 192.8788 167.1488 13.74544297181865
UO-22
1 21575U 91050B 94256.22189981 .00000055 00000-0 33203-4 0 5330
2 21575 98.4285 328.9113 0008458 32.3799 327.7902 14.36931169165727
KO-23
1 22077U 92052B 94256.02060840 -.00000037 00000-0 10000-3 0 4262
2 22077 66.0831 96.0859 0015366 267.3404 92.5856 12.86287005 98087
KO-25
1 22830U 93061H 94256.71982330 .00000035 00000-0 31384-4 0 3314
2 22830 98.5473 327.9662 0010822 279.6321 80.3637 14.28063011 50335
KO-25?
1 22828U 93061F 94252.72559872 .00000008 00000-0 20933-4 0 3025
2 22828 98.6426 327.7279 0010011 313.8817 46.1535 14.28064960 17844
IO-26
1 22826U 93061D 94256.23874288 .00000014 00000-0 23555-4 0 3248
2 22826 98.6482 331.1882 0009071 318.6418 41.4073 14.27738766 50255
AO-27
1 22825U 93061C 94256.75478020 .00000027 00000-0 28788-4 0 3267
2 22825 98.6474 331.6469 0008523 316.8301 43.2207 14.27634167 50320
PO-28
1 22829U 93061G 94252.73268152 .00000028 00000-0 28925-4 0 3172
2 22829 98.6449 327.7537 0009768 314.2350 45.8028 14.28039306 49766
Mir
1 16609U 86017A 94258.20132585 .00011449 00000-0 16164-3 0 7604
2 16609 51.6475 96.0036 0002326 32.7325 327.3803 15.57072087490046

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
September 20, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1466. STS-64 Orbital State Vector Rev #125

Newsgroup: rec.radio.amateur.space
Date: 1994-09-17 22:15:19 UTC
From: astroman@netcom.com
Message-ID: <astromanCwAoHK.9M3@netcom.com>
Source record: 26814
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-64
Catalog Number: 23251 94059A
Epoch Date/Time: 94260.66825368056
09/17/1994 16:02:17.118 UTC
EFG E: -5402543.24 ft
F: 17581775.41 ft
G: 11551302.18 ft
Edot: -17411.6526 ft/s
Fdot: 5509.8431 ft/s
Gdot: -16504.2524 ft/s
ndot/2 (drag): 0.00008622484 rev/day^2
nddt/6: 3.07363E-10 rev/day^3
Bstar: 7.50352E-06 1/Earth Radii
Elset #: 17
Rev @ Epoch: 125.39052469100

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1467. ARLS030 SAREX Packet QRV

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 01:19:04 UTC
From: w1aw@arrl.org
Message-ID: <$arls030.1994@ampr.org>
Source record: 26820
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB SPACE @ ARL $ARLS030
ARLS030 SAREX Packet QRV

ZCZC AS74
QST de W1AW
Space Bulletin 030 ARLS030
From ARRL Headquarters
Newington, CT September 17, 1994
To all radio amateurs

SB SPACE ARL ARLS030
ARLS030 SAREX Packet QRV

SAREX Packet QRV

All scheduled SAREX activities have been completed. Lou McFadin,
W5DID, reports that NASA Mission Control has given the STS-64
SAREX crew the go ahead to turn on their packet station. There
will be several passes over the USA between now and stowage time.
This crew likes voice contacts, so don't be surprised if they
show up on that mode.

Equipment stowage commences Sunday, September 18 at 1822z.
NNNN
/EX
```

1468. STS-64 packet?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 07:43:49 UTC
From: rtm@newton.apple.com
Message-ID: <rtm-180994084349@kip-71.apple.com>
Source record: 26823

Well, packet *finally* got running on STS-64. I'd appreciate copies of beacon texts or other packet copy after 23:55 PDT on 9/17/94 (that's 06:55 GMT on 9/18.94) to see which list I managed to make. Please send 'em to me via email or post 'em.

Congrats to the following hams for their perseverance in getting the following contact numbers (the only ones I copied):

KB7MTC #221
KJ6MD #224
KD6MSM #226

--
73-
Bob Martin N6MZV * rtm@newton.apple.com
Apple Computer, Inc *

1469. SAREX Packet??? Maybe!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 08:44:52 UTC
From: malari@ix.netcom.com
Message-ID: <35gum4$7m2@ixnews1.ix.netcom.com>
Source record: 26822

==========

In <$arls030.1994@ampr.org> w1aw@arrl.org writes:

>All scheduled SAREX activities have been completed. Lou McFadin,
>W5DID, reports that NASA Mission Control has given the STS-64
>SAREX crew the go ahead to turn on their packet station. There
>will be several passes over the USA between now and stowage time.
>This crew likes voice contacts, so don't be surprised if they
>show up on that mode.
>
>Equipment stowage commences Sunday, September 18 at 1822z.
>NNNN
>/EX
>
>

==========

Well, after spending many late nights waiting for the shuttle to pass over.. hearing nothing time after time, it's real nice to know that they "MIGHT" turn it on for the last few orbits... in fact, trying to work the shuttle has gotten as bad as trying to find an open lane at a bowling alley. The only way you can bowl anymore is to become a member of a league. Do the members of the amateur radio community have to go back to elementary school to be allowed to talk to the shuttle anymore? STS-64 was more boring than watching the crystals grow in previous missions.

At least they showed something on NASA SELECT. This time, even when they were doing something of interest, the videos were short if not at all. The Video Highlights were the only thing that even gave you a hint of what was going on up there.

What happened to the cargo bay cameras when everyone up there was asleep?

They used to show live earth views during sleep periods but lately this has not been happening at all.

The last SAREX mission was only good for those who lived south of the 28th para. because the orbiter never faced north anytime during that mission. I guess thats o.k. if you live in Texas, Florida or any of the southern states. I would have liked to have at least had a shot at getting a QSL card for the 25th aniversary of the APOLLO lunar landing. I realize that not everyone can make contact during a SAREX mission but it gets a little frustrating when you get cut entirely out of the loop.

If I sound a little bitter, it's only a small token of what many of us are feeling about the last few SAREX missions... I am only passing on some of the complaints that I have heard along with some of my own... I hope that NASA is listening and takes the time to acknowledge this amoung all of the other problems that they have to deal with.

In closing, I seriously hope that this improves over time and all amateurs are allowed to become active participants in the space program, not just selected groups.

- Mike -
WD6EFM
Sacramento, Ca.

P.S. It was not my intent to discredit those who work directly with SAREX at NASA... I know that they work very hard to make SAREX work for ALL amateurs. Keep up the good work and try not to forget the rest of us who want to participate too!

1470. Re: SAREX Packet??? Maybe!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 15:54:06 UTC
From: dparker@netcom.com
Message-ID: <dparkerCwC1I6.1qH@netcom.com>
Source record: 26824

M.A. Lari (malari@ix.netcom.com) wrote:
: ==
: Well, after spending many late nights waiting for the shuttle to pass
: over.. hearing nothing time after time, it's real nice to know that
: they "MIGHT" turn it on for the last few orbits... in fact, trying
: to work the shuttle has gotten as bad as trying to find an open lane
: at a bowling alley. The only way you can bowl anymore is to become a

Worked the Shuttle last night on Packet, still all goosebumpy!

If it were real easy to work the shuttle, I don't think it
would make the contacts as exciting as they are. My hats off
to everyone behind the SAREX missions, thanks very much.

Dave

****
* Dave Parker = KD6RRS = *
* Tracy, California, USA *
* Internet e-mail: dparker@netcom.com *
* Packet: KD6RRS@WA6YHJ.#NOCAL.CA.USA.NA *
****

1471. Re: STS-64 packet? (QSL BEACON)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 17:12:45 UTC
From: hardie@herald.usask.ca
Message-ID: <35hsed$t0t@tribune.usask.ca>
Source record: 26825

From article <rtm-180994084349@kip-71.apple.com>, by rtm@newton.apple.com (Bob Martin N6MZV):
> Well, packet *finally* got running on STS-64. I'd appreciate copies of
> beacon texts or other packet copy after 23:55 PDT on 9/17/94 (that's 06:55

I copied this QSL beacon at about 0350Z 18th Sep.
If anyone copied it earlier than this I'd really like to know if it's got me in there as number 11 or 15. And whether a later beacon shows me as #99.
I had to scramble to get the packet set up as I was expecting more voice and didn't have the TNC configured properly and also the shuttle is very difficult to copy up here, especially when it sends out long packets like the QRZ and QSL which get nailed by a fade.

W5RRR-1>QSL <UI>:AL7HJ/93 WL7IM/86 AL7PJ/85 K0MVL/84 W2RS/83 VE1KK/73 KG3N/66 N8VIC/50 VE7DOX/45 VE6AMB/43 WA2IQJ/38 KB8KVE/33 N1PPP/32 VE3JF/26 N8IGJ/21

73 de Pete
ve5va.qrp@usask.ca
--
ve5va.qrp@usask.ca

1472. ANS-260 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 17:19:32 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-260.01.1994@ampr.org>
Source record: 26827
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-260.01
STS-64 ACTIVE ON PACKET

HR AMSAT NEWS SERVICE BULLETIN 260.01 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 17, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-260.01

STS-64 SAREX Is Active On Packet Radio

After several days of being silent on packet, the STS-64 SAREX payload came alive today on packet. The general reason given for the silence was to conserve electrical power inorder to extend the mission of STS-64 for another day. KA3HDO reports that the SAREX packet payload was turned on today and will remain on until it has to be stowed for landing. Listen for on the packet downlink link frequency of 145.550 MHz and remember that the the uplink is on 144.490 MHz. However, before transmitting, listen to the downlink for voice operations as voice operations are always a possibility.

[The AMSAT News Service (ANS) would like to thank Frank Bauer (KA3HDO) for the information which went into this bulletin item.]

/EX
SB SAT @ AMSAT $ANS-260.02
AMSAT-NA BOD ELECTION RESULTS

HR AMSAT NEWS SERVICE BULLETIN 253.02 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 17, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-260.02

AMSAT-NA Board Election Results Announced

Martha Saragovitz, AMSAT's Corporate Secretary, announces the results of the recent election to fill three seats on the organization's Board of Directors.

A total of 1548 ballots were received at AMSAT Headquarters by the September 15th deadline.

The vote was:

Tom Clark W3IWI 1199
Andy Mac Allister WA5ZIB 837
Keith Baker KB1SF 781
Bob Myers W1XT 614
Lou McFadin W5DID 573

John Hansen WA0PTV 505

Therefore Tom Clark and Andy MacAllister are returned to the Board and Keith Baker replaces Joe Kasser (G3ZCZ). Bob Myers becomes the First Alternate and Lou McFadin the Second Alternate. The alternates serve until the next election, one year form now.

Thus, for the next year, the AMSAT-NA Board will consist of:

Keith Baker KB1SF
Tom Clark W3IWI
Dick Daniels W4PUJ
Junior deCastro PY2BJO
Rbt. Diersing N5AHD
Andy MacAllister WA5ZIB
Bill Tynan W3XO

/EX
SB SAT @ AMSAT $ANS-260.03
AMSAT-NA SYMPOSIUM INFO

HR AMSAT NEWS SERVICE BULLETIN 260.03 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 17, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-260.01

AMSAT-NA Symposium Hotel Room Availability Information

Martha at the AMSAT office informs ANS that all rooms at the Orlando Airport Holiday Inn in the AMSAT block for Oct. 7th and 8th have been filled. The hotel management says, however, that those coming the AMSAT Space Symposium will be accommodated at the AMSAT-NA group rate subject to availability of rooms. Martha urges those desiring to attend who have not yet made a room reservation, to do so as soon as possible. The Holiday Inn Orlando Airport can be reached at (407) 851-6400.

/EX
SB SAT @ AMSAT $ANS-260.04
ANTARCTIC PACSAT STATION

HR AMSAT NEWS SERVICE BULLETIN 260.04 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 17, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-260.04

Argentine Antarctic Satellite Operation

On 14-SEP-94 an Argentine team sailed on an icebreaker carrying a portable MICROSAT station and two AMSAT volunteers, LU2AOQ and LU9AFP. The objective is to demonstrate digital satellite communication including the transfer images and data files to those stationed in Antarctica with an aim of eventually placing permanent amateur satellite stations in Antarctica.

Such a demonstration is made all the more relevant because normal HF communication between Antarctic bases and the South American continent are frequently interrupted, especially during this portion of the solar cycle.

The ice breaker is working under callsign LU7AA, and will be underway for about one week. In addition to operating on the MICROSATs, the AMSAT volunteers will working the RS satellites.

All the amateur community is invited to participate in this experiment.

The portable station being used was assembled by LU5EO.

[The AMSAT News Service (ANS) would like to thank Gustavo Carpignano (LW2DTZ) of AMSAT-LU for the information used in this bulletin.]

/EX
SB SAT @ AMSAT $ANS-260.05
JARL SPECIAL EVENT STATION

HR AMSAT NEWS SERVICE BULLETIN 260.05 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 17, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-260.05

JARL Sponsors A Special Event Station

In connection with the International Telecommunications Union 14th Plenipotentiary Conference to be held in Kyoto Japan from 17 September to 14 of October, the Japan Amateur Radio League, has set up a special amateur radio station using the call 8N3ITU. The station is available to all Conference attendees who are licensed amateurs in their particular countries. Many Post and Telecommunication Ministers and their assistants from all over the world are to attend this meeting. The station will be capable of operating all modes from 1.9MHz to 1200 MHz, including AO-13 and other satellites.

Amateurs are reminded that 8N3 is not a new country, just JA, and that this is not a DXpedition. Japanese operators will be present but only to assist operators from foreign countries. They are instructed not to handle "pile-ups." Amateurs are asked to please not disturb the operation of 8N3ITU and please not engage in DXpedition style pile-ups. QSLs for contacts with 8N3ITU will be sent via the JARL bureau. For those who cannot use the bureau, they may send cards and an SASE to 8N3ITU,JARL-KANSAI 3-8-31 DAIDOU,TENNOUJI,OSAKA 543, JAPAN.

JAMSAT played a very important roll in achieving satellite capability for 8N3ITU. It is hoped that this will demonstrate, to the delegates, the possibilities and importance of Amateur Radio Satellites. Hopefully it may influence some governments, of countries where satellite operation is inhibited, to open the VHF and UHF Bands for Amateur Satellites Usage.

Although this operation is coming at a time when AO-13 is not in its best orientation and the station may be hampered by a long coax run, the JAMSAT volunteers are doing their best to put on a successful satellite demonstration for some influential people. AMSAT wishes them luck in this worthwhile project.

JAMSAT expresses special thanks to the Japan Ministry of Postal and Telecommunication and JARL-HQ for this opportunity.

[The AMSAT News Service (ANS) would like to thank Mikio Mouri (JA3GEP) for the information used in this bulletin.]

/EX
SB SAT @ AMSAT $ANS-260.06
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 260.06 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 17, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-260.06

Weekly OSCAR Status Reports: 17-SEP-94

AO-13: Current Transponder Operating Schedule:
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Alon/Alat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
==========
[G3RUH/DB2OS/VK5AGR]

FO-20: The FO-20 command team has mentioned before that digital mode operation of the bird will be continued for a while because mode switching between digital mode (Mode-JD) and analog mode may cause some problem of onboard command system. [Kazu Sakamoto (JJ1WTK)]

AO-16: WD0E reports that as of 18-SEP-94 the team of WJ9F, WD0E and VK7ZBX is continuing the software relaod of AO-16. Last night the first stage was completed and PACSAT is under full software control and sending normal telemetry. Loading of the remainder of the software, including the BBS, will probably take a few more days. [wd0e@amsat.org]

LO-19: After of being out of service since May, LUSAT-OSCAR-19's BBS is now working again! Last May, for some yet determined reason, the BBS crashed during a pass over South America near a region know for its high-energy particle activity called the South Atlantic Anomaly. Last Sunday, 11-SEP-94, AMSAT-LU ground controllers were able to bring LO-19's BBS back on-line. [LW2DTZ]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a

regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1473. Re: SAREX Packet??? Maybe!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 17:43:03 UTC
From: wdunckel1@aol.com
Message-ID: <35hu77$7nj@newsbf01.news.aol.com>
Source record: 26826

In article <35gum4$7m2@ixnews1.ix.netcom.com>, malari@ix.netcom.com (M.A. Lari) writes:

I for one was amazed at the number of passes they made with someone on the radio. I think they did a great job doing all they could to make it as easy as possible for us hams on the ground. (Heck, they even changed the inclination of their orbit for us northern hams!! HA!) This was the first time I really followed the ham activity, but it seemed like they went all out this time. Almost every pass I monitored had someone at the radio (except for the ones during their sleep period). I guess this was not enough for some people.
Thanks NASA!!!!!!! Next time I will make contact! KD6VYV

1474. SAREX Contact at last!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 17:55:10 UTC
From: caver@acca.nmsu.edu
Message-ID: <35hutu$4mi@dns1.NMSU.Edu>
Source record: 26848

Finally, after several years of listening to SAREX missions and
operating satellites, I was rewarded with an FM voice QSO with
KB5SIW onboard Discovery.

At 21:35 UTC on Saturday, several area hams were surprised to hear
voice instead of packet coming from orbit. I switched to fm voice
on my Yaesu FT-736, checked power at 25 watts, and positioned my
Oscar-13 20 element crossed yagi for the point in the pass, 53
degrees local elevation. A few seconds later I was to hear my
callsign returning from Discovery.

Granted, most hams don't have Oscar gear to talk to the shuttle,
but my point that it isn't that hard to do. On the last SAREX flight,
a local ham beat me out for a packet connect using 10 watts and a
5 element FM beam on a low pass. The key is to know where it is.
Tracking programs are a dime a dozen on the net. The main thing
we have to overcome is the massive amount of traffic and QRM the
shuttle hears. Other factors such as orbiter attitude and mission
priorities come into play, but most of this can be found with
a little digging this group and the wa3nan.gsfc.nasa.gov site, and
compensated for. Personally I feel that it's all part of the game
and is part of what makes it fun and a feeling of accomplishment.

My kudos to the SAREX team and keep up the good work.

73's
-- ----
Tom Kindel - NW5B caver@acca.nmsu.edu
Las Cruces, New Mexico
---Modesty is for those who have no talent!---
Anon

1475. Re: Radio Astronomy

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 20:55:03 UTC
From: stevek3446@aol.com
Message-ID: <35i9f7$ae1@newsbf01.news.aol.com>
Source record: 26828

In article <he7T3oL.wietlispach@delphi.com>, Timothy Wietlispach
<wietlispach@delphi.com> writes:

I just joined the Society of Amateur Radio Astronomers. Write to :
Hal Braschwitz, Treasurer
3623 West 139th Street
Cleveland,OH 44111

for more info. Hope this helps!

1476. NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-18 22:17:26 UTC
From: Iver@ksu.ksu.edu
Message-ID: <35ie9m$545@matt.ksu.ksu.edu>
Source record: 26829

I tries to collect a picture from NOAA 11 on 17 Sept, at about 2230 UTC.
ll I got was a black screen. NOAA 11 was transmitting its gray bar data
but no APT images (Vis and IR). I was receiving at 137.62 MHz.

Has anyone heard about any trouble with NOAA 11?
Have I been missing out on the news?

Thanks

1477. Re: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 02:59:38 UTC
From: ckalmar@slopok.cca.rockwell.com
Message-ID: <CwCwBF.Hw8@lazrus.cca.rockwell.com>
Source record: 26830

i
Noaa-11 avhrr instrument has failed. It is unable to image.
Nesdis personell are diligently seeking a solution to this problem.
All imagery is halted until furthur notice.
-copied from goes-tap service on september 14. Goestap service
downloads whole orbit data and makes whole sector composites out of
them. This is a shame, as noaa 11 can see the volcano eruption
in new zealand but cannot transmit anything.
~:

1478. STS-64 Checkpoint #10

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 11:15:05 UTC
From: tstader@aol.com
Message-ID: <35jrrp$lvq@newsbf01.news.aol.com>
Source record: 26831

MacSPOC Users-

The attached checkpoint removes 50.8 miles of downtrack error accumulated since the last update. Monday's KSC weather outlook remains unfavorable due to forecast thundershowers and low clouds in the area.

-Dan Adamo

```
==================
File: STS64-10.cp
==================
Orbit 148 at 9/04:00 MET
1994 252 ( 9- 9) 22 22 54.947
1994 262 ( 9-19) 2 30 .000
0.244961460485D+07 0.615653709772D+00
3 148
0.205225132441D+08 0.418964850361D+07 -0.575879554321D+07
-0.834029339537D+04 0.129662030583D+05 -0.202626109017D+05
986.5 222592.0 79.00 2.72
009/19:00:11.0 -205.200 239.900 -85.500
```

1479. NOAA,METEOSAT Images, from where??

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 11:18:13 UTC
From: s.saffer@ieee.org
Message-ID: <s.saffer.1.000B4DC3@ieee.org>
Source record: 26839

If anyone knows where I could obtain high quality images form the NOAA and METEOSAT satellites (ie. ftp sites etc.), I would very much apprecite it if they could contact me at the email address below. We, as part of the United Nations GRID (Global Resource Infromation Database) organization are thinking about purchasing some kind of satellite receiver system and would like to do some research into which system to buy (which satellites to receive from).

```
------- ------- -- -------
--------- --------- -- --------
-- -- -- -- -- --
-- ---- -------- -- -- -- DENMARK
-- ---- -------- -- -- --
-- -- -- -- -- -- --
--------- -- -- -- --------
------- -- -- -- -------
```


Steven Saffer	Net: s.saffer@ieee.org
TELEDANMARK Jydsk Telefon	Telephone: (+45) 86 20 20 11 EXT. 4505
R&D Department	Fax: (+45) 86 19 74 50
Forskerparken	
Gustav Wieds Vej 10	
8000 Aarhus C	
Denmark	

1480. Re: SAREX Packet??? Maybe!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 13:02:08 UTC
From: davetaylor@aol.com
Message-ID: <35k24g$mvu@newsbf01.news.aol.com>
Source record: 26832

In article <35gum4$7m2@ixnews1.ix.netcom.com>, malari@ix.netcom.com (M.A. Lari) writes:

The last SAREX mission was only good for those who lived south of the 28th para. because the orbiter never faced north anytime during that mission. I guess thats o.k. if you live in Texas, Florida or any of the southern states. I would have liked to have at least had a shot at getting a QSL card for the 25th aniversary of the APOLLO lunar landing. I realize that not everyone can make contact during a SAREX mission but it gets a little frustrating when you get cut entirely out of the loop.

No need for you to be out of the loop. I worked the last mission from Maryland with 70W erp out of a 4-element Yagi in my attic. Maybe you just need to try harder.

Dave, WB8QXA
Columbia MD

1481. STS-64 Element Set (94262.565)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 14:00:52 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94262.565@alsys.com>
Source record: 26833
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94262.56598602 .00005023 10876-4 74517-5 0 372
2 23251 57.0107 179.0447 0009603 288.9755 71.0290 16.12345417 1564

Satellite: STS-64
Catalog number: 23251
Epoch time: 94262.56598602 = (19 SEP 94 13:35:01.19 UTC)
Element set: 037
Inclination: 57.0107 deg
RA of node: 179.0447 deg Space Shuttle Flight STS-64
Eccentricity: .0009603 Keplerian element set JSC-037
Arg of perigee: 288.9755 deg from NASA flight Day 10 vector
Mean anomaly: 71.0290 deg
Mean motion: 16.12345417 rev/day Gil Carman
Decay rate: 4.6181e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 156

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1482. STS-64 QSL info

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 16:37:37 UTC
From: tboza@sedona.intel.com
Message-ID: <35keoh$bhf@chnews.intel.com>
Source record: 26834

Does anyone know the QSL information for STS-64?
Thanks,
Tom WB7ASR...

1483. Re: BPSK and FM modems

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 17:36:37 UTC
From: magliaco@pilot.njin.net
Message-ID: <35ki75$a1k@pilot.njin.net>
Source record: 26835

In article <940916155147@ken_durham.linear.sc.ti.com>, ken@sislnews.csc.ti.com (Ken Durham) writes:
>
> What kind of TNC and Modem should be used for the 9600 baud BPSK and 1200
> baud PSK and FM birds? Can a single TNC/modem combo be used for both?
> There has been some discussion of k9ng and g3ruh modems, but nothing to
> explain if they are both suitable for Satellite packet.

A "normal" TNC is used for both low speed (1200 bps) and high speed (9600 bps) Pacsat communications along with an external modem. At 1200 bps (AO-16, WO-18, LO-19, FO-20, IO-26 satellites), the satellites transmit using BPSK modulation and is typically received using an SSB receiver (70-cm band). Uplinks take Manchester encoded packet data and use it to frequency modulate a 2-meter FM transmitter, producing FSK.

9600 bps communications (both satellite and terrestrial) use straight FSK modulation without Manchester encoding to keep the transmitted bandwidth within the passband of a NBFM receiver. BPSK is not generally used at this data rate since SSB transmitters are typically used in this application, and the narrow bandwidth of SSB transmitters precludes their use for transmitting data at 9600 bps.

> Would someone tell me what you are using for these modes and what you would
> recommend for a low budget system?

Check out the August 1994 issue of QEX for a description of my 1200 bps BPSK Pacsat Modem. The article also explains how the modem can be used for terrestrial communications, and how BPSK signals are handled and how Manchester encoding works (and the striking similarity between the two).

You can get a copy directly from the ARRL by writing to Maty Weinberg:

Maty Weinberg
ARRL
225 Main St.
Newington, CT 06111
USA

73, de John, KD2BD

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1484. RE: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 20:06:06 UTC
From: srghsjm@grv.grace.cri.nz
Message-ID: <35kr2o$rmj@zephyr.grace.cri.nz>
Source record: 26838

In Article <35ie9m$545@matt.ksu.ksu.edu>
lver@ksu.ksu.edu (Lloyd Paul Verhage) writes:

>I tries to collect a picture from NOAA 11 on 17 Sept, at about 2230 UTC.
>ll I got was a black screen. NOAA 11 was transmitting its gray bar data
>but no APT images (Vis and IR). I was receiving at 137.62 MHz.
>
>Has anyone heard about any trouble with NOAA 11?
>Have I been missing out on the news?
>
>Thanks
>

The NOAA-11 AVHRR failed sometime on the 13th of September. There has
not been a great deal from NOAA/NESDIS about this yet, but a brief report
indicated that the fault appeared to be electrical. Having gathered
daily AVHRR imagery from this satellite since 1989 we were rather sad to
see our old friend depart so suddenly. We even held a wake on our
roof where the HRPT antenna is housed.

The next satellite in the NOAA series, NOAA-J while on the ground or
NOAA-14 when in operation, is due for launch 4 December. Keep your fingers
crossed for this one, because if it doesn't work then we're in the ....

Stephen

+---+
| Stephen McNeill Phone : +64-4-569 0180 |
| Image Processing Team Direct : +64-4-569 0183 |
| Landcare Research New Zealand Ltd FAX : +64-4-569 0181 |
| Box 38-491 Internet: srghsjm@gih.grace.cri.nz |
| Wellington Mail Centre Omnet : s.mcneill |
| New Zealand Packet : zl4hg @ zl4hg.wlg.nzl.oc |
+---+

1485. ARLS031 SAREX additional day

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 20:57:58 UTC
From: w1aw@arrl.org
Message-ID: <$arls031.1994@ampr.org>
Source record: 26836
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS031
ARLS031 SAREX additional day

ZCZC AS75
QST de W1AW
Space Bulletin 031 ARLS031
From ARRL Headquarters
Newington, CT September 19, 1994
To all radio amateurs

SB SPACE ARL ARLS031
ARLS031 SAREX additional day

Astronauts To Operate SAREX An Additional Day

The SAREX Working Group reports that the postponement of Monday's shuttle landing has given the amateur community another day to contact the astronauts on 2-meters. This crew has been particularly active making random contacts throughout their flight. There will be several passes over the US between now and stowage time. The crew has indicated they will make themselves available for voice contacts during the additional day, until they have to stow the equipment again for landing on Tuesday, September 20.

Those wishing to contact the Discovery astronauts in voice mode are encouraged to listen to the downlink frequency, 145.55 MHz, FIRST before transmitting. Ground based radio amateurs need to transmit on one of the following voice uplink frequencies, 144.91, 144.93, 144.95, 144.97 or 144.99 MHz. The crew does not favor any of these frequencies. The crew call signs are KB5SIW, KC5HBS and KC5HBR.

Thanks to Lou McFadin, W5DID, of the SAREX Working Group for the preceding information.
NNNN
/EX

1486. Re: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-19 23:25:53 UTC
From: lver@ksu.ksu.edu
Message-ID: <35l6m1$eom@matt.ksu.ksu.edu>
Source record: 26837

srghsjm@grv.grace.cri.nz writes:

>In Article <35ie9m$545@matt.ksu.ksu.edu>
>lver@ksu.ksu.edu (Lloyd Paul Verhage) writes:

>The NOAA-11 AVHRR failed sometime on the 13th of September. There has
>not been a great deal from NOAA/NESDIS about this yet, but a brief report
>indicated that the fault appeared to be electrical. Having gathered
>daily AVHRR imagery from this satellite since 1989 we were rather sad to
>see our old friend depart so suddenly. We even held a wake on our
>roof where the HRPT antenna is housed.

I take it then, that when the AVHRR failed, it included the APT data?
Does APT come from AVHRR?

Thanks

1487. Re: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 06:46:41 UTC
From: yokoyama@tkl.iis.u-tokyo.ac.jp
Message-ID: <YOKOYAMA.94Sep20154641@akasaka.tkl.iis.u-tokyo.ac.jp>
Source record: 26840

In article <35l6m1$eom@matt.ksu.ksu.edu> lver@ksu.ksu.edu (Lloyd Paul Verhage) writes:

|I take it then, that when the AVHRR failed, it included the APT data?
|Does APT come from AVHRR?

Yes. HRPT and APT comes from AVHRR data. Someone said the APT data is
black outed.

yama

1488. STS-64 Checkpoint #11

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 10:07:04 UTC
From: tstader@aol.com
Message-ID: <35mc88$dih@newsbf01.news.aol.com>
Source record: 26841

MacSPOC Users-

The enclosed checkpoint reflects tracking into Monday evening CDT and removes 13.2 miles of downtrack error accumulated since the last update. After Discovery's Monday wave-off from a KSC landing, both KSC and EDW deorbit opportunities will be assessed Tuesday. Although weather violations at KSC continue to be forecast, EDW conditions appear acceptable. The following sequence of deorbit opportunities is included in this checkpoint for v1.5 users. It may be input manually by v1.1 users by selecting "Maneuvers..." from the "Update" menu.

Deorbit to KSC on Orbit 174:
TIG = 10/18:49:39 MET
DVx =-206.9 fps (retrograde)
DVy = 231.9 fps (southward)
DVz = -87.5 fps (upward)

Deorbit to KSC on Orbit 175:
TIG = 10/20:22:34 MET
DVx =-209.1 fps (retrograde)
DVy =-211.7 fps (northward)
DVz =-125.4 fps (upward)

Deorbit to EDW on Orbit 176:
TIG = 10/21:53:16 MET
DVx =-219.2 fps (retrograde)
DVy =-234.7 fps (northward)
DVz = -33.9 fps (upward)

Deorbit to EDW on Orbit 177:
TIG = 10/23:26:53 MET
DVx =-227.1 fps (retrograde)
DVy = 225.6 fps (southward)
DVz = -42.2 fps (upward)

-Dan Adamo
=================
File: STS64-11.cp
=================
Orbit 165 at 10/04:37 MET
1994 252 (9- 9) 22 22 54.947
1994 263 (9-20) 3 0 .000
0.244961562568D+07 0.764113911174D+00
1 165
-0.216105434000D+08 0.327415600000D+06 0.202423350000D+07
0.178103426400D+04 -0.139513201880D+05 0.212479171440D+05

```
986.5 221912.0 79.00 2.72
010/18:49:39.0 -206.900 231.900 -87.500
010/20:22:34.0 -209.100 -211.700 -125.400
010/21:53:15.6 -219.200 -234.700 -33.900
010/23:26:52.8 -227.100 225.600 -42.200
```

1489. Military SATCOM advice needed!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 12:49:27 UTC
From: hpeach@ca.uky.edu
Message-ID: <hpeach.143.000CD305@ca.uky.edu>
Source record: 26843

Last Christmas I received a Grove ScannerBeam as a gift. I am now getting around to putting it
up (I have a lot of half-built kits too). My thought has been that my main use for this antenna
would be to receive military satellites in the 200-400 MHz band. To do this is going to require
the outlay of some additional cash so I have a few questions:

1) Is there enough traffic being transmitted in the clear via these birds to make the investment
worthwhile? What type of comms (i.e., would I be able to listen to the operations going on in
Haiti if I had this in place now or would I just pickup routine stuff?) can one expect to hear?

2) Is the typical mode FM, SSB, or what?

3) Is it reasonable to assume that a log periodic, 10dB preamp, and a PRO-2004 (feeding an
ICOM 745 if SSB is needed) will do a decent job?

4) WHO MAKES AN INEXPENSIVE, REMOTELY POWERED PREAMP THAT WOULD WORK
FOR THIS APPLICATION?

5) WHERE CAN I FIND AN INEXPENSIVE, LIGHT DUTY AZ-EL ROTOR FOR THIS
APPLICATION?

Please reply via e-mail as I do not regularily read this group.

73, Harold, N4FLZ

Harold
hpeach@ca.uky.edu

1490. STS-64 Element Set (94263.557)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 13:46:03 UTC
From: elements-request@alsys.com
Message-ID: <STS-64.94263.557@alsys.com>
Source record: 26842
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-64
1 23251U 94059A 94263.55791700 .00054878 10930-4 76563-4 0 382
2 23251 57.0108 174.3179 0010435 300.6551 59.3503 16.12408131 1723

Satellite: STS-64
Catalog number: 23251
Epoch time: 94263.55791700 = (20 SEP 94 13:23:24.02 UTC)
Element set: 038
Inclination: 57.0108 deg
RA of node: 174.3179 deg Space Shuttle Flight STS-64
Eccentricity: .0010435 Keplerian element set JSC-038
Arg of perigee: 300.6551 deg from NASA flight Day 11 vector
Mean anomaly: 59.3503 deg
Mean motion: 16.12408131 rev/day Gil Carman
Decay rate: 5.4878e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 172

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1491. Re: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 20:55:08 UTC
From: srghsjm@grv.grace.cri.nz
Message-ID: <35nial$6g1@zephyr.grace.cri.nz>
Source record: 26844

In Article <CwCwBF.Hw8@lazrus.cca.rockwell.com>
ckalmar@slopok.cca.rockwell.com (Christopher Kalmar) writes:

>Noaa-11 avhrr instrument has failed. It is unable to image.
>Nesdis personell are diligently seeking a solution to this problem.
>All imagery is halted until furthur notice.
>-copied from goes-tap service on september 14. Goestap service
>downloads whole orbit data and makes whole sector composites out of
>them. This is a shame, as noaa 11 can see the volcano eruption
>in new zealand but cannot transmit anything.

Slight correction required here. The volcano eruption is in Papua New Guinea
not New Zealand. The two countries are an awful long way apart !

AVHRR failed 23:30 UTC on 13 September.

Stephen

+---+
| Stephen McNeill Phone : +64-4-569 0180 |
| Image Processing Team Direct : +64-4-569 0183 |
| Landcare Research New Zealand Ltd FAX : +64-4-569 0181 |
| Box 38-491 Internet: srghsjm@gih.grace.cri.nz |
| Wellington Mail Centre Omnet : s.mcneill |
| New Zealand Packet : zl4hg @ zl4hg.wlg.nzl.oc |
+---+

1492. ARLK041 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 20:57:29 UTC
From: w1aw@arrl.org
Message-ID: <$arlk041.1994@ampr.org>
Source record: 26846
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK041
ARLK041 Keplerian data

ZCZC SK09
QST de W1AW
Keplerian Bulletin 41 ARLK041
From ARRL Headquarters
Newington, CT September 20, 1994
To all radio amateurs

SB KEP ARL ARLK041
ARLK041 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94254.05030619 -.00000192 00000-0 10000-3 0 3080
2 14129 26.8972 308.5366 6028238 209.9975 94.5175 2.05881264 56585
RS-10/11
1 18129U 87054A 94259.06060329 .00000027 00000-0 13079-4 0 9577
2 18129 82.9205 261.6689 0012780 126.3312 233.9016 13.72341388362378
UO-11
1 14781U 84021B 94259.55664486 .00000118 00000-0 27826-4 0 7312
2 14781 97.7853 270.0022 0011805 343.5640 16.5180 14.69245619563726
RS-12/13
1 21089U 91007A 94261.15456134 .00000038 00000-0 24598-4 0 7304
2 21089 82.9220 302.5081 0028116 207.6788 152.2863 13.74046397181416
AO-13
1 19216U 88051B 94255.03141595 -.00000341 00000-0 10000-4 0 9639
2 19216 57.7390 231.5483 7231710 350.0805 0.9547 2.09725791 16330
UO-14
1 20437U 90005B 94260.24520782 .00000021 00000-0 25048-4 0 314
2 20437 98.5872 343.7577 0010412 283.6457 76.3562 14.29855283242741
AO-16
1 20439U 90005D 94261.20697721 .00000006 00000-0 19484-4 0 8296
2 20439 98.5961 346.0402 0010748 281.6298 78.3679 14.29909137242893
DO-17
1 20440U 90005E 94260.73242676 .00000023 00000-0 25767-4 0 8302
2 20440 98.5967 345.9264 0010797 282.1116 77.8842 14.30049101242843
```

```
WO-18
1 20441U 90005F 94260.77940046 .00000008 00000-0 20293-4 0 8327
2 20441 98.5964 345.9670 0011387 282.6574 77.3334 14.30022831242854
LO-19
1 20442U 90005G 94261.24106417 .00000014 00000-0 22526-4 0 8280
2 20442 98.5972 346.7038 0011669 280.6449 79.3421 14.30120276242933
FO-20
1 20480U 90013C 94261.38526384 -.00000024 00000-0 11456-4 0 7264
2 20480 99.0514 35.6582 0541300 128.3652 236.7383 12.83227663216082
AO-21
1 21087U 91006A 94260.98935951 .00000094 00000-0 82657-4 0 5131
2 21087 82.9371 74.0296 0034792 183.1054 176.9892 13.74544644182336
UO-22
1 21575U 91050B 94260.74803762 .00000001 00000-0 14773-4 0 5345
2 21575 98.4283 333.3428 0008359 19.5123 340.6381 14.36931313166370
KO-23
1 22077U 92052B 94260.60791282 -.00000037 00000-0 10000-3 0 4273
2 22077 66.0822 86.4803 0015420 264.9756 94.9498 12.86287179 98678
KO-25
1 22830U 93061H 94261.20397519 .00000014 00000-0 22905-4 0 3320
2 22830 98.5472 332.3546 0010765 265.5648 94.4296 14.28063452 50973
KO-25?
1 22828U 93061F 94261.69386811 .00000010 00000-0 21704-4 0 3044
2 22828 98.6420 336.6006 0009634 285.7967 74.2151 14.28066214 19120
IO-26
1 22826U 93061D 94260.72390188 .00000004 00000-0 19414-4 0 3258
2 22826 98.6476 335.6251 0008768 305.0158 55.0188 14.27739247 50893
AO-27
1 22825U 93061C 94261.24026932 -.00000005 00000-0 15790-4 0 3275
2 22825 98.6472 336.0840 0008396 304.1084 55.9297 14.27634336 50963
PO-28
1 22829U 93061G 94261.70111181 -.00000006 00000-0 15528-4 0 3192
2 22829 98.6438 336.6264 0009543 287.0663 72.9463 14.28040464 51040
Mir
1 16609U 86017A 94260.89691555 .00002605 00000-0 42024-4 0 7653
2 16609 51.6472 82.5087 0002246 47.9785 312.1398 15.57075821490464

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Saturday,
September 24, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1493. Windows satellite logging program

Newsgroup: rec.radio.amateur.space
Date: 1994-09-20 22:58:52 UTC
From: tboza@sedona.intel.com
Message-ID: <35npfc$gl2@chnews.intel.com>
Source record: 26847

Does anyone know where I can acquire a Windows logging program
that is designed for satellite operation? I want to track satellite
awards (WAS & DXCC) on each of the differnet birds and satellite modes
(SAT MODE: A, B, J, S, etc..) (QSO MODE: SSB, Packet, CW etc..)
Today Im using an EXCEL spread sheet because all the Windows based
logbook programs currently available are designed for HF operation.
HF logging programs don't take in consideration all the additional
satellite options, modes and freqs.

Tnx and 73s

Tom WB7ASR...

1494. Satellite frequencies listing

Newsgroup: rec.radio.amateur.space
Date: 1994-09-21 00:12:13 UTC
From: wstaub@random.ucs.mun.ca
Message-ID: <35ntot$6r6@coranto.ucs.mun.ca>
Source record: 26845

Looking for latest list of all possible satellite frequencies. Latest list
in my possession is dated May 1993 and must be outdated by now. Anyone having
the latest listing may post same either here or e-mail to me at:
wstaub@random.ucs.mun.ca
Any help will be appreciated. 73, VO1CAT, Werner

1495. Re: SAREX Status/Keps 9/12 at 11:00 UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-09-21 05:37:03 UTC
From: winter@apple.com
Message-ID: <35ogpv$96h@apple.com>
Source record: 26852

In article <352dvc$ckg@sandra.teleport.com>,
Phil Biehl <philb@teleport.com> wrote:
>I'm a little new at this. I've been listening for STS-64 for several
>days now and have heard absolutely nothing. My tracking program seems to
>be working ok as it agrees with the display I see from NASA Select.

Phil--

You didn't mention at what times you were listening, but those
particular passes may have been at times when the astronauts were
asleep. And they didn't have the packet system on until a couple
of days before landing. They were very active on voice when they
were awake; I heard them on almost every pass over the Bay Area.

>I'm listening on 145.55 and xmitting packet on 144.49.

Don't ever transmit--even on a different frequency--until you're
sure that there are SAREX operations (voice or packet) in progress.
It's at least a waste of time, and if your transmit frequency is
shared with other users (e.g. the voice uplink freqs., which are
used for packet in most of the U.S.), you'll be interfering with
other hams to no purpose.

73,
Patty

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

1496. Calling the shuttle (was Re: SAREX Status/Keps 9/12 at 11:00 UTC)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-21 05:46:48 UTC
From: winter@apple.com
Message-ID: <35ohc8$a78@apple.com>
Source record: 26849

In article <354fkd$kmr@chnews.intel.com>,
Thomas A. Boza~ <tboza@sedona.intel.com> wrote:
>
>I heard Susan, KB5IWS, from STS-64 on 145.55 last night making two differnet
>QSOs.
>
>She did not call CQ, and From what I understand, "YOU" have to call CQ,
>and they (Susan) will answer you.

No, all you have to do is transmit your callsign *after* you hear
signs of voice operations from the shuttle. The astronauts are trained
by the SAREX folks to operate contest- or DXpedition-style. They call
CQ briefly and then work through the resulting pileup. They'll only call
CQ again if the pileup disappears (not likely :-)).

NB: Susan Helms isn't a ham; she was using Dick Richards' callsign.
I had the great pleasure of talking to her on Thursday--my first-ever
voice contact with the shuttle.

Patty

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

1497. NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-21 05:48:00 UTC
From: geoff.kennedy@woodybbs.com
Message-ID: <93.1269.7587.0NFB3223@woodybbs.com>
Source record: 26858

While squawking about NOAA 11 problems ? (18 Sep 94 17:17:11),
Lver@ksu.ksu.edu babbled this to All:

Lv> Message-ID: <35ie9m$545@matt.ksu.ksu.edu>
Lv> Newsgroup: rec.radio.amateur.space
Lv> Organization: Kansas State University

Lv> I tries to collect a picture from NOAA 11 on 17 Sept, at about 2230
Lv> UTC. ll I got was a black screen. NOAA 11 was transmitting its gray
Lv> bar data but no APT images (Vis and IR). I was receiving at 137.62
Lv> MHz.

Lv> Has anyone heard about any trouble with NOAA 11?
Lv> Have I been missing out on the news?

NOAA 11's AVHRR has died - apparently some electronic problem.
Because the AVHRR data is used to generate the APT pictures, there is no
longer any of the latter.

NOAA 9 has been re-activated, and NOAA 10's APT (not sure about the
rest of the stuff available) has been turned off, probably because it is
conflicting with NOAA 12.

FYI - NOAA-J is scheduled to be launched Dec. 4.

... "Kennedy's Space Centre" Coquitlam, B.C., CANADA
--- Blue Wave/Max v2.12
* Origin: Frog Hollow Port Moody BC 604-469-0264 (1:153/290)

1498. Society of Amateur Radio Astronomers: WWW

Newsgroup: rec.radio.amateur.space
Date: 1994-09-21 07:23:24 UTC
From: springbd@shell.portal.com
Message-ID: <35on1c$pt4@news1.shell>
Source record: 26850

The Society of Amateur Radio Astronomers (SARA) now has a home page on the Web, with information about how to get started in amateur radio astronomy, where to get components and software, and an index of SARA Journal articles since 1983. The URL is:

http://IRsociety.com/0c:/sara.htm|/

(Note, because the Web server is DOS based, the URL ends in .htm|/ (where '|' is the vertical pipe symbol) rather than the standard .html/. Also, the '0c:' is the number zero, rather than the letter 'O' which has caused some confusion!)

The Society also operates a free BBS at (608) 835-9605.

SARA is an international non-profit organization with 325 members, and is open to all who are interested in amateur radio astronomy.

Best wishes,

Bob Lash & Mike Fremont
Maintainers of the SARA Home Page
boblash@fununiv.com
springbd@shell.portal.com

1499. Packet Radio (SAREX)!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-21 08:24:44 UTC
From: malari@ix.netcom.com
Message-ID: <35oqkc$qnv@ixnews1.ix.netcom.com>
Source record: 26851

For those of you who read my article, "(SAREX) Packet Radio MAYBE!!!", I rec'd many responses to it in various forms, some supportive, some critical and then there was this response that really hit home. As you can see, Gerry spent a fair amount of time to prepare this letter and I felt that I couldn't keep it to myself. He clearly represents the "SPIRIT OF AMATEUR RADIO" and did a great job in explaining SAREX to me... Thanks Gerry, I hope all of you enjoy this as much as I have.

73's to all

Mike

WD6EFM - Sacramento, Ca.

<start of forwarded message>
==========

Mike, I feel like maybe a personal response might help...

In article <35gum4$7m2@ixnews1.ix.netcom.com> you write:
>Well, after spending many late nights waiting for the shuttle to pass
>over.. hearing nothing time after time, it's real nice to know that
>they "MIGHT" turn it on for the last few orbits... in fact, trying
>to work the shuttle has gotten as bad as trying to find an open lane
>at a bowling alley. The only way you can bowl anymore is to become a
>member of a league. Do the members of the amateur radio community have
>to go back to elementary school to be allowed to talk to the shuttle
>anymore? STS-64 was more boring than watching the crystals grow in
>previous missions.

Let me start with a caveat: I'm off for several years going back to school... trying to get into medical school. Officially, I'm on leave without pay from my job as a contractor at NASA's Johnson Space Center. I am still a co-investigator on SAREX. I'm no longer involved in the day-to-day warfare iwith SAREX, but I did ALL the training for over 6 years, and am intimately familiar with the problems the Team faces from management and the Astronaut Office...

Over time, the missions have gotten more involved. This serves to severely impact crew time for SAREX operations. Therefore, when the crew are all busy, it gets harder for them to look out the window, say to themselves, "Selves, I think I'll play SAREX during this CONUS pass," and just do it. On missions when there are a lot of maneuvers, the Pilot and Commander are pretty busy. This time, that was 2 of 3 licensed operator (Dick, SIW, and Blaine, HBS). During EVA, they are all busy playing safety observer, copying comments from MCC, etc.

Unfortunately, SAREX remains a secondary experiment. This means that we can be demoted in priority with little notice. Further, our sponser at NASA HQ is the Office of Education. Of all the SAREX Goals and Objectives, the conversations with school kids have a higher profile than talking to Joe Ham. And, let me be candid. In dealing with the astronauts, I came to the realization that with some notable exceptions, the crews also see this as a unique opportunity to have some positive impact on the kids. It took some serious soul searching to get back the reality that talking to the general ham population was THAT important, and we had some raucous SAREX team meetings where I took the unpopular position that we should carry SAREX even if all we did was the school contacts... and crew personal contacts... In fact, for some period, when there was some official flak from the Cief of the Astronaut Office (Dan Brandenstein, at that time), I was on record as telling the crew in training that while it'd be nice if they'd do General QSO passes, it wasn't THAT important. And before the flames come, realize that I was working from a different, and possibly incorrect perspective, I don't know. I do know I've modified my position over time, though.

On this mission, the electrical power constraint that prevented packet operations was considered very real by mission management. So real, in fact, that as late as 5 weeks before launch, we considered cancelling SAREX operations completely, because we were being told we'd just get school passes, ONLY on batteries, and nothing else. That was not an acceptable alternative to us. Nor was it to the crew. Commander Dick Richards called in some markers and got a little relief on the position. Further, from what I understand, Dick was the one who got permission to turn on PACKET, after the SAREX representatives in Mission Control (yes, Virginia, we maintain a full-time presence there during SAREX missions) were turned down. Further, Dick elected to delay stowage by almost 8 hours on his own initiative. We decided that, if we made an issue of it, some paper pusher might make him stow on-time... we sat quietly.

One more note: We schedule a primary and a backup pass in the Crew timeline for each school. Lou McFadin, the Principal Investgator was able to convince me, and subsequently the Astronaut Office and NASA Mission Management that if the school contact was successful on the primary pass, rather than giving the backup pass back to the mission, we would retain it for General QSO Operations. This actually put quite a bit of operating time into the timeline for general ops that never was there before. Packet Ops were ALWAYS intended to be there for when voice ops were not possible... In fact, the original intent of packet ops on STS-35, where Ron Parise (WA4SIR) wore us down to redesign the hardware to include packet, was to have a no-crew-time-impact operating mode, since he was so busy. The fact that we were able to make it such a power miser was a bonus (Thanks, Heathkit, for the HK-21's!).

>At least they showed something on NASA SELECT. This time, even when
>they were doing something of interest, the videos were short if not
>at all. The Video Highlights were the only thing that even gave you a
>hint of what was going on up there.
>
>What happened to the cargo bay cameras when everyone up there was
>asleep?

>
>They used to show live earth views during sleep periods but lately
>this has not been happening at all.

Even during Shuttle missions, NASA shares TDRSS time for communications. Between the mandatory data downlinks (on the order of 95 mbits/sec), the Deep Space Network's requirements, Orbiter communications, and experiment data downlinks, the ~300 Mbits/sec bandwidth doesn't last too long. A lot of the payload bay earth views were predicated on Earth-Obs mission requirements in the past, so NASA targetted them. Further, during Spacelab missions, Marshall Space Flight Center frequently has data requirements for PLD BAY camery views, just specifically for background. My personal opinion: The NASA/JSC folks are so proud of the Silicone graphics DMOS display (that simulation of the shuttle including accurate attitude info and ground track) that they've forgotten how captivating the view out the window is! I intend to talk to them later this week about that...

>The last SAREX mission was only good for those who lived south of the
>28th para. because the orbiter never faced north anytime during that
>mission. I guess thats o.k. if you live in Texas, Florida or any of
>the southern states. I would have liked to have at least had a shot
>at getting a QSL card for the 25th aniversary of the APOLLO lunar
>landing. I realize that not everyone can make contact during a SAREX
>mission but it gets a little frustrating when you get cut entirely
>out of the loop.

Sorry.... Realize that I didn't get a contact, either, last time... Between classes, and weekends in MCC, I was NEVER near a radio when they came overhead. And that's the way it's gone for ME the whole project. My first SAREX contact was with STS-45 during an unscheduled pass... one of the crew wanted to ask us some questions, and as that had been happening, we staffed W5RRR (JSC's ham club station). Since this one was at 0-dark-30, I was told by the FLight Director to leave my console and go cover it... I did, and talked to Brian Duffy for my first Shuttle contact... From his voice, I don't know if he or I was happier (STS-45 is the fondest memory I have of crew training... one of the best groups of humans I've ever known). My other contacts have been a single packet QSO on STS-50, and voice contacts on STS-55, -56 and -64... And I'm supposed to have an inside track according to some folks Ive seen posting...

>If I sound a little bitter, it's only a small token of what many of us
>are feeling about the last few SAREX missions... I am only passing on
>some of the complaints that I have heard along with some of my own...
>I hope that NASA is listening and takes the time to acknowledge this
>amoung all of the other problems that they have to deal with.

Color it noted... I will make a point to bring this up to the rest of the Team. We are cognizant of the folks on the ground, and would like to see more general QSOs. I still maintain my position that the educational aspect is the most important, but I do realize how important it is to get the crews talking to the population in general as a means of maintaining support for the program (both Shuttle AND SAREX!).

>In closing, I seriously hope that this improves over time and all
>amateurs are allowed to become active participants in the space
>program, not just selected groups.

We do still have to compete for the crew's time. We're real lucky to have folks like Steve Nagel (N5RAW), Ken Cameron (KB5AWP), Jay Apt (N5QWL), Dick Richards (KB5SIW), and Ellen Baker (KB5SIX) who are so enthusiastic that they go out of their way to make time for SAREX. We also have some crew members who are so motivated by the education aspect that THAT alone was their reason for getting the ticket. And some who were browbeaten into it... but that's another story (ask me later about the crew whose intraoffice routing and approval slips were a list of callsigns and "OTHER").

>P.S. It was not my intent to discredit those who work directly with
> SAREX at NASA... I know that they work very hard to make SAREX
> work for ALL amateurs. Keep up the good work and try not to
> forget the rest of us who want to participate too!

Thanks... We DO try...

Hope this offers some solace. I can understand the frustration, and wish there was something I could do about it. I actually feel that, when I get back down there I might be able to have more impact on some of the issues, like crew training and attitudes, as well as some of the bureaucracy that I deal with better than some other Team members...

<
<this portion deleted in consideration of Gerry's privacy.. malari>
<

73, Gerry
--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

==========
<end of forwarded message>

P.S.

If you think this was as good as I thought it was, drop Gerry an e-mail to let him know.

- Mike -

1500. STS-68 Element Set (94273.528)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-22 15:01:41 UTC
From: elements-request@alsys.com
Message-ID: <STS-68.94273.528@alsys.com>
Source record: 26853
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-68
1 00068U 94273.52881651 .00126891 00000-0 63979-4 0 36
2 00068 56.9988 77.8829 0009615 272.7810 87.2164 16.20171184 21

Satellite: STS-68
Catalog number: 00068
Epoch time: 94273.52881651 = (30 SEP 94 12:41:29.75 UTC)
Element set: 003
Inclination: 56.9988 deg
RA of node: 77.8829 deg Space Shuttle Flight STS-68
Eccentricity: .0009615 Prelaunch element set JSC-003
Arg of perigee: 272.7810 deg Launch: 30 SEP 94 11:16 UTC
Mean anomaly: 87.2164 deg
Mean motion: 16.20171184 rev/day Gil Carman
Decay rate: 1.26891e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 2

--
--
Gary Morris Internet: garym@alsys.com (garym@cts.com)
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1501. RS-10 and license classes

Newsgroup: rec.radio.amateur.space
Date: 1994-09-22 18:39:00 UTC
From: billkuhn@vtaix.cc.vt.edu
Message-ID: <35sj04$al3@solaris.cc.vt.edu>
Source record: 26854

I have a question regarding license classes required to use
satellites such as RS-10. Any help is greatly appreciated.
I am giving a talk on satellites to our club tomorrow
evening, and inquiring minds will want to know...

The uplink to RS-10 is on 2 meters. The downlink is on
10 meters. Is it legal for a No-Code Tech to transmit
to the satellite and have his/her signal transponded to
10 meters? That is, can they use the satellite for QSOs?

The answer to this is certainly not obvious to me. The no-code
is licensed to use 2 meters, but not 10 meters. They are
transmitting on 2 meters, which is perfectly legal, but
they are also transmitting (indirectly by way of the
transponder) on 10 meters which does not seem legal.

I am a member of AMSAT and have numerous books covering the
satellites, but this question seems to not be addressed
anywhere! It seems like this would be one of the first
things one would want to know.

If you know the answer, please post it together with a
source of where this is clearly spelled out (maybe buried in
the FCC regs somewhere, hopefully...).

Thanks in advance for your help.

Bill Kuhn
KO4MH

1502. Re: RS-10 and license classes

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 01:15:57 UTC
From: little@iamu.chi.dec.com
Message-ID: <35ta8d$dm9@nntpd.lkg.dec.com>
Source record: 26855

In article <35sj04$al3@solaris.cc.vt.edu>, billkuhn@vtaix.cc.vt.edu (Bill Kuhn) writes:
|>I have a question regarding license classes required to use
|>satellites such as RS-10. Any help is greatly appreciated.
|>I am giving a talk on satellites to our club tomorrow
|>evening, and inquiring minds will want to know...
|>
|>The uplink to RS-10 is on 2 meters. The downlink is on
|>10 meters. Is it legal for a No-Code Tech to transmit
|>to the satellite and have his/her signal transponded to
|>10 meters? That is, can they use the satellite for QSOs?
|>
|>The answer to this is certainly not obvious to me. The no-code
|>is licensed to use 2 meters, but not 10 meters. They are
|>transmitting on 2 meters, which is perfectly legal, but
|>they are also transmitting (indirectly by way of the
|>transponder) on 10 meters which does not seem legal.

The no-code technician is limited in terms of not being the control
operator for a 10 meter station. Since he is not the control operator
for RS-10, he is certainly allowed to use RS-10 as the only station
he is the control operator for is his 2 meter transmitter. So yes,
a no-code technician *can* use RS-10.

|>I am a member of AMSAT and have numerous books covering the
|>satellites, but this question seems to not be addressed
|>anywhere! It seems like this would be one of the first
|>things one would want to know.
|>
|>If you know the answer, please post it together with a
|>source of where this is clearly spelled out (maybe buried in
|>the FCC regs somewhere, hopefully...).

From part 97.3

(6) Automatic control. The use of devices and
procedures for control of a station when it is transmitting so that
compliance with the FCC Rules is achieved without the control operator
being present at a control point.

(11) Control operator. An amateur operator designated
by the licensee of a station to be responsible for the transmissions from
that station to assure compliance with the FCC Rules.

(37) Space station. An amateur station located more
than 50 km above the Earth's surface.

97.9 Operator license. - (a) There are 5 classes of operator licenses: Novice, Technician, General, Advanced and Amateur Extra. An operator license authorizes the holder to be the control operator of a station with the privileges of the operator class specified on the license. The license document or a photocopy thereof must be in the personal possession of the licensee at all times when the person is the control operator of a station.

From part 97.109 Station control.

(d) When a station is being automatically controlled, the control operator need not be at the control point. Only stations transmitting RTTY or data emissions on the 6 m or shorter wavelength bands, and stations specifically designated elsewhere in this part may be automatically controlled. Automatic control must cease upon notification by an EIC that the station is transmitting improperly or causing harmful interference to other stations. Automatic control must not be resumed without prior approval of the EIC.

From part 97.113

(f) No amateur station, except an auxiliary, repeater, or space station, may automatically retransmit the radio signals of other amateur station.

From part 97.207

(d) A space station may automatically retransmit the radio signals of Earth stations and other space stations.

So the space station operates in automatic control and the user of the satellite is *not* the control operator. As such, 10 meter privileges are not required.

73,
Todd
N9MWB

1503. Re: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 05:24:22 UTC
From: srghsjm@grv.grace.cri.nz
Message-ID: <35tote$15t@zephyr.grace.cri.nz>
Source record: 26857

In Article <35l6m1$eom@matt.ksu.ksu.edu>
lver@ksu.ksu.edu (Lloyd Paul Verhage) writes:
>
>I take it then, that when the AVHRR failed, it included the APT data?
>Does APT come from AVHRR?
>

Yes. The raw stuff which comes out of APT comes from the AVHRR data,
cunningly processed to give fairly even resolution over the wide
angle swath. The main instrument is plus or minus 55 degrees and so
the resolution of the AVHRR degrades severely from nadir to edge.

You can probably still hear APT, or the HRPT data for that matter,
but it is all rubbish imagery (when I looked early this week).
However, cheer up, there is still NOAA-12. NOAA-9 is a bit punch
drunk, but generally useful.

Stephen

+--+
| Stephen McNeill Phone : +64-4-569 0180 |
| Image Processing Team Direct : +64-4-569 0183 |
| Landcare Research New Zealand Ltd FAX : +64-4-569 0181 |
| Box 38-491 Internet: srghsjm@gih.grace.cri.nz |
| Wellington Mail Centre Omnet : s.mcneill |
| New Zealand Packet : zl4hg @ zl4hg.wlg.nzl.oc |
+--+

1504. Static satellite tracking device

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 08:10:35 UTC
From: caralt@gaig.upc.es
Message-ID: <35u2hrINNgo0@diable.upc.es>
Source record: 26856

Dear Sir,
At the Telecommunications School of the Polytechnical University of Catalonia, Barcelona, Spain (namely: "Escola Superior d'Enginyers de Telecomunicaci&#65533; de Barcelona, Universitat Polit&#65533;cnica de Catalunya, Barcelona, Spain) we are developping a project on Amateur Satellite Communications, which consists in a full design of a static antenna for satellite tracking. By static we mean that no part of the antenna moves while tracking is in progress. The system is based on the theory known as "Phased Array": the movement of the beam is not mechanic but electronic.
This technology is spreading quite rapidely because of its reliability and performace, specially in the field of RADAR and professional satellite links. But as far as we know, the usage of such devices has not been put into practice by radio amateurs. All the systems that are operating are based on crossed rotating Yagi; its simplicity is obvious but all the control system is not: two precise rotors (quite expensive), computer control, complex programs to lock on desired satellites, maintenance, etc.
Our system is totally reliable and more effective than those used by radio amateurs. We believe that our project is the first of this nature and we would like to share all the information that we have obtained with other people interested. New information on this field will be welcome. We would be very grateful if you could spread this news anywhere you considered, as well as our E-mail.

Yours faithfully.

1505. orbs$266.1of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 14:44:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-266.o.1994@ampr.org>
Source record: 26775
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-266.O
Orbital Elements 266.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX September 23, 1994
BID: $ORBS-266.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94254.05030619
Element set: 308
Inclination: 26.8972 deg
RA of node: 308.5366 deg
Eccentricity: 0.6028238
Arg of perigee: 209.9975 deg
Mean anomaly: 94.5175 deg
Mean motion: 2.05881264 rev/day
Decay rate: -1.92e-06 rev/day^2
Epoch rev: 8455
Checksum: 324

Satellite: UO-11
Catalog number: 14781
Epoch time: 94263.57473666
Element set: 732
Inclination: 97.7855 deg
RA of node: 273.8325 deg
Eccentricity: 0.0011504
Arg of perigee: 330.5055 deg
Mean anomaly: 29.5500 deg
Mean motion: 14.69245930 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 56431
Checksum: 307

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94263.50806321
Element set: 958
Inclination: 82.9207 deg
RA of node: 258.3796 deg
Eccentricity: 0.0013008
Arg of perigee: 115.1045 deg
```

Mean anomaly: 245.1460 deg
Mean motion: 13.72341562 rev/day
Decay rate: 3.1e-07 rev/day^2
Epoch rev: 36298
Checksum: 291

Satellite: AO-13
Catalog number: 19216
Epoch time: 94256.93865187
Element set: 964
Inclination: 57.7380 deg
RA of node: 231.2127 deg
Eccentricity: 0.7232007
Arg of perigee: 350.2215 deg
Mean anomaly: 0.9340 deg
Mean motion: 2.09725609 rev/day
Decay rate: -4.12e-06 rev/day^2
Epoch rev: 4787
Checksum: 302

Satellite: FO-20
Catalog number: 20480
Epoch time: 94261.38526384
Element set: 726
Inclination: 99.0514 deg
RA of node: 35.6582 deg
Eccentricity: 0.0541300
Arg of perigee: 128.3652 deg
Mean anomaly: 236.7383 deg
Mean motion: 12.83227663 rev/day
Decay rate: -2.4e-07 rev/day^2
Epoch rev: 21608
Checksum: 296

Satellite: AO-21
Catalog number: 21087
Epoch time: 94260.98935951
Element set: 513
Inclination: 82.9371 deg
RA of node: 74.0296 deg
Eccentricity: 0.0034792
Arg of perigee: 183.1054 deg
Mean anomaly: 176.9892 deg
Mean motion: 13.74544644 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 18233
Checksum: 330

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94261.15456134

Element set: 730
Inclination: 82.9220 deg
RA of node: 302.5081 deg
Eccentricity: 0.0028116
Arg of perigee: 207.6788 deg
Mean anomaly: 152.2863 deg
Mean motion: 13.74046397 rev/day
Decay rate: 3.8e-07 rev/day^2
Epoch rev: 18141
Checksum: 294

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94262.03583661
Element set: 280
Inclination: 2.0483 deg
RA of node: 94.8577 deg
Eccentricity: 0.2912797
Arg of perigee: 191.9219 deg
Mean anomaly: 161.1305 deg
Mean motion: 1.42202795 rev/day
Decay rate: -1.23e-06 rev/day^2
Epoch rev: 253
Checksum: 285

/EX
SB KEPS @ AMSAT $ORBS-266.D
Orbital Elements 266.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX September 23, 1994
BID: $ORBS-266.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94260.24520782
Element set: 31
Inclination: 98.5872 deg
RA of node: 343.7577 deg
Eccentricity: 0.0010412
Arg of perigee: 283.6457 deg
Mean anomaly: 76.3562 deg
Mean motion: 14.29855283 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 24274
Checksum: 303

Satellite: AO-16
Catalog number: 20439
Epoch time: 94261.20697721
Element set: 829

Inclination: 98.5961 deg
RA of node: 346.0402 deg
Eccentricity: 0.0010748
Arg of perigee: 281.6298 deg
Mean anomaly: 78.3679 deg
Mean motion: 14.29909137 rev/day
Decay rate: 6.0e-08 rev/day^2
Epoch rev: 24289
Checksum: 341

Satellite: DO-17
Catalog number: 20440
Epoch time: 94260.73242676
Element set: 830
Inclination: 98.5967 deg
RA of node: 345.9264 deg
Eccentricity: 0.0010797
Arg of perigee: 282.1116 deg
Mean anomaly: 77.8842 deg
Mean motion: 14.30049101 rev/day
Decay rate: 2.3e-07 rev/day^2
Epoch rev: 24284
Checksum: 304

Satellite: WO-18
Catalog number: 20441
Epoch time: 94260.77940046
Element set: 832
Inclination: 98.5964 deg
RA of node: 345.9670 deg
Eccentricity: 0.0011387
Arg of perigee: 282.6574 deg
Mean anomaly: 77.3334 deg
Mean motion: 14.30022831 rev/day
Decay rate: 8.0e-08 rev/day^2
Epoch rev: 24285
Checksum: 312

Satellite: LO-19
Catalog number: 20442
Epoch time: 94261.24106417
Element set: 828
Inclination: 98.5972 deg
RA of node: 346.7038 deg
Eccentricity: 0.0011669
Arg of perigee: 280.6449 deg
Mean anomaly: 79.3421 deg
Mean motion: 14.30120276 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 24293
Checksum: 302

Satellite: UO-22
Catalog number: 21575
Epoch time: 94260.74803762
Element set: 534
Inclination: 98.4283 deg
RA of node: 333.3428 deg
Eccentricity: 0.0008359
Arg of perigee: 19.5123 deg
Mean anomaly: 340.6381 deg
Mean motion: 14.36931313 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 16637
Checksum: 295

Satellite: KO-23
Catalog number: 22077
Epoch time: 94260.60791282
Element set: 427
Inclination: 66.0822 deg
RA of node: 86.4803 deg
Eccentricity: 0.0015420
Arg of perigee: 264.9756 deg
Mean anomaly: 94.9498 deg
Mean motion: 12.86287179 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 9867
Checksum: 342

Satellite: AO-27
Catalog number: 22825
Epoch time: 94261.24026932
Element set: 327
Inclination: 98.6472 deg
RA of node: 336.0840 deg
Eccentricity: 0.0008396
Arg of perigee: 304.1084 deg
Mean anomaly: 55.9297 deg
Mean motion: 14.27634336 rev/day
Decay rate: -5.0e-08 rev/day^2
Epoch rev: 5096
Checksum: 310

Satellite: IO-26
Catalog number: 22826
Epoch time: 94265.20906155
Element set: 326
Inclination: 98.6469 deg
RA of node: 340.0607 deg
Eccentricity: 0.0008701
Arg of perigee: 291.5298 deg
Mean anomaly: 68.4957 deg
Mean motion: 14.27739405 rev/day

Decay rate: -3.0e-07 rev/day^2
Epoch rev: 5153
Checksum: 317

Satellite: KO-25
Catalog number: 22830
Epoch time: 94261.20397519
Element set: 332
Inclination: 98.5472 deg
RA of node: 332.3546 deg
Eccentricity: 0.0010765
Arg of perigee: 265.5648 deg
Mean anomaly: 94.4296 deg
Mean motion: 14.28063452 rev/day
Decay rate: 1.4e-07 rev/day^2
Epoch rev: 5097
Checksum: 310

Satellite: 22828
Catalog number: 22828
Epoch time: 94261.69386811
Element set: 304
Inclination: 98.6420 deg
RA of node: 336.6006 deg
Eccentricity: 0.0009634
Arg of perigee: 285.7967 deg
Mean anomaly: 74.2151 deg
Mean motion: 14.28066214 rev/day
Decay rate: 1.0e-07 rev/day^2
Epoch rev: 1912
Checksum: 312

/EX

1506. orbs$266.2of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 14:49:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-266.w.1994@ampr.org>
Source record: 26778
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-266.W
Orbital Elements 266.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX September 23, 1994
BID: $ORBS-266.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94264.78473792
Element set: 961
Inclination: 99.0391 deg
RA of node: 316.3555 deg
Eccentricity: 0.0014722
Arg of perigee: 310.1811 deg
Mean anomaly: 49.8067 deg
Mean motion: 14.13644294 rev/day
Decay rate: 1.08e-06 rev/day^2
Epoch rev: 50390
Checksum: 314

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94264.71043503
Element set: 858
Inclination: 98.5109 deg
RA of node: 270.7745 deg
Eccentricity: 0.0014197
Arg of perigee: 49.6655 deg
Mean anomaly: 310.5763 deg
Mean motion: 14.24905697 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 41624
Checksum: 329

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94264.84702047
Element set: 405
Inclination: 82.5428 deg
RA of node: 191.6933 deg
Eccentricity: 0.0015357
Arg of perigee: 273.2351 deg
```

Mean anomaly: 86.7043 deg
Mean motion: 13.84721360 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 33573
Checksum: 298

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94263.50790002
Element set: 327
Inclination: 82.5348 deg
RA of node: 256.2229 deg
Eccentricity: 0.0019482
Arg of perigee: 27.1381 deg
Mean anomaly: 333.0750 deg
Mean motion: 13.16968720 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29580
Checksum: 295

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94264.86831799
Element set: 779
Inclination: 99.1796 deg
RA of node: 256.1884 deg
Eccentricity: 0.0011153
Arg of perigee: 219.8719 deg
Mean anomaly: 140.1625 deg
Mean motion: 14.13017320 rev/day
Decay rate: 6.5e-07 rev/day^2
Epoch rev: 30879
Checksum: 333

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94263.48156725
Element set: 327
Inclination: 82.5102 deg
RA of node: 67.9382 deg
Eccentricity: 0.0014714
Arg of perigee: 326.7609 deg
Mean anomaly: 33.2607 deg
Mean motion: 13.84371975 rev/day
Decay rate: 1.2e-07 rev/day^2
Epoch rev: 28087
Checksum: 320

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94265.26027486

Element set: 151
Inclination: 82.5530 deg
RA of node: 202.8546 deg
Eccentricity: 0.0007809
Arg of perigee: 46.2814 deg
Mean anomaly: 313.8946 deg
Mean motion: 13.04410592 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23555
Checksum: 285

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94260.68464305
Element set: 829
Inclination: 82.5473 deg
RA of node: 135.0161 deg
Eccentricity: 0.0014451
Arg of perigee: 248.4464 deg
Mean anomaly: 111.5145 deg
Mean motion: 13.84181599 rev/day
Decay rate: -3.3e-07 rev/day^2
Epoch rev: 21341
Checksum: 292

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94265.07669375
Element set: 103
Inclination: 98.8262 deg
RA of node: 282.1036 deg
Eccentricity: 0.0016870
Arg of perigee: 102.6160 deg
Mean anomaly: 257.6893 deg
Mean motion: 14.01330748 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 20727
Checksum: 306

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94262.53810013
Element set: 838
Inclination: 82.5206 deg
RA of node: 70.9087 deg
Eccentricity: 0.0013824
Arg of perigee: 138.2251 deg
Mean anomaly: 221.9964 deg
Mean motion: 13.83589113 rev/day
Decay rate: 3.5e-07 rev/day^2
Epoch rev: 20080

Checksum: 283

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94260.58744253
Element set: 736
Inclination: 82.5399 deg
RA of node: 104.2812 deg
Eccentricity: 0.0012941
Arg of perigee: 320.4884 deg
Mean anomaly: 39.5272 deg
Mean motion: 13.16464714 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16351
Checksum: 289

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94264.63268759
Element set: 188
Inclination: 98.6110 deg
RA of node: 290.2587 deg
Eccentricity: 0.0012645
Arg of perigee: 321.6371 deg
Mean anomaly: 38.3904 deg
Mean motion: 14.22448820 rev/day
Decay rate: 8.5e-07 rev/day^2
Epoch rev: 17421
Checksum: 305

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94263.48785247
Element set: 742
Inclination: 82.5466 deg
RA of node: 49.4259 deg
Eccentricity: 0.0012649
Arg of perigee: 325.0841 deg
Mean anomaly: 34.9446 deg
Mean motion: 13.16833670 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 14900
Checksum: 317

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94260.60958337
Element set: 337
Inclination: 82.5444 deg
RA of node: 133.2096 deg
Eccentricity: 0.0023099

Arg of perigee: 331.1116 deg
Mean anomaly: 28.8772 deg
Mean motion: 13.83014568 rev/day
Decay rate: 1.7e-07 rev/day^2
Epoch rev: 5286
Checksum: 304

/EX
SB KEPS @ AMSAT $ORBS-266.M
Orbital Elements 266.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX September 23, 1994
BID: $ORBS-266.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94261.70111181
Element set: 319
Inclination: 98.6438 deg
RA of node: 336.6264 deg
Eccentricity: 0.0009543
Arg of perigee: 287.0663 deg
Mean anomaly: 72.9463 deg
Mean motion: 14.28040464 rev/day
Decay rate: -6.0e-08 rev/day^2
Epoch rev: 5104
Checksum: 291

Satellite: MIR
Catalog number: 16609
Epoch time: 94263.91337372
Element set: 768
Inclination: 51.6465 deg
RA of node: 67.4039 deg
Eccentricity: 0.0002303
Arg of perigee: 55.9412 deg
Mean anomaly: 304.1818 deg
Mean motion: 15.57092900 rev/day
Decay rate: 2.349e-05 rev/day^2
Epoch rev: 49093
Checksum: 306

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94263.56201773
Element set: 537
Inclination: 28.4704 deg
RA of node: 343.3027 deg
Eccentricity: 0.0006270
Arg of perigee: 8.3135 deg

Mean anomaly: 351.7553 deg
Mean motion: 14.90675622 rev/day
Decay rate: 4.03e-06 rev/day^2
Epoch rev: 4363
Checksum: 270

Satellite: GRO
Catalog number: 21225
Epoch time: 94263.40288782
Element set: 142
Inclination: 28.4631 deg
RA of node: 290.9650 deg
Eccentricity: 0.0003518
Arg of perigee: 201.9854 deg
Mean anomaly: 158.0562 deg
Mean motion: 15.41277550 rev/day
Decay rate: 1.913e-05 rev/day^2
Epoch rev: 7164
Checksum: 287

Satellite: UARS
Catalog number: 21701
Epoch time: 94265.10692193
Element set: 598
Inclination: 56.9866 deg
RA of node: 130.6744 deg
Eccentricity: 0.0004615
Arg of perigee: 113.8817 deg
Mean anomaly: 246.2705 deg
Mean motion: 14.96465254 rev/day
Decay rate: 2.274e-05 rev/day^2
Epoch rev: 16544
Checksum: 315

/EX

1507. orbs$266.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 14:51:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-266.n.1994@ampr.org>
Source record: 26776
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-266.N
2Line Orbital Elements 266.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX September 23, 1994
BID: $ORBS-266.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94254.05030619 -.00000192 00000-0 10000-3 0 3080
2 14129 26.8972 308.5366 6028238 209.9975 94.5175 2.05881264 84553
UO-11
1 14781U 84021B 94263.57473666 .00000043 00000-0 15101-4 0 7328
2 14781 97.7855 273.8325 0011504 330.5055 29.5500 14.69245930564319
RS-10/11
1 18129U 87054A 94263.50806321 .00000031 00000-0 16789-4 0 9588
2 18129 82.9207 258.3796 0013008 115.1045 245.1460 13.72341562362984
AO-13
1 19216U 88051B 94256.93865187 -.00000412 00000-0 10000-4 0 9649
2 19216 57.7380 231.2127 7232007 350.2215 0.9340 2.09725609 47870
FO-20
1 20480U 90013C 94261.38526384 -.00000024 00000-0 11456-4 0 7264
2 20480 99.0514 35.6582 0541300 128.3652 236.7383 12.83227663216082
AO-21
1 21087U 91006A 94260.98935951 .00000094 00000-0 82657-4 0 5131
2 21087 82.9371 74.0296 0034792 183.1054 176.9892 13.74544644182336
RS-12/13
1 21089U 91007A 94261.15456134 .00000038 00000-0 24598-4 0 7304
2 21089 82.9220 302.5081 0028116 207.6788 152.2863 13.74046397181416
ARSENE
1 22654U 93031B 94262.03583661 -.00000123 00000-0 00000 0 0 2809
2 22654 2.0483 94.8577 2912797 191.9219 161.1305 1.42202795 2536
UO-14
1 20437U 90005B 94260.24520782 .00000021 00000-0 25048-4 0 314
2 20437 98.5872 343.7577 0010412 283.6457 76.3562 14.29855283242741
AO-16
1 20439U 90005D 94261.20697721 .00000006 00000-0 19484-4 0 8296
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2 20439 98.5961 346.0402 0010748 281.6298 78.3679 14.29909137242893
DO-17
1 20440U 90005E 94260.73242676 .00000023 00000-0 25767-4 0 8302
2 20440 98.5967 345.9264 0010797 282.1116 77.8842 14.30049101242843
WO-18
1 20441U 90005F 94260.77940046 .00000008 00000-0 20293-4 0 8327
2 20441 98.5964 345.9670 0011387 282.6574 77.3334 14.30022831242854
LO-19
1 20442U 90005G 94261.24106417 .00000014 00000-0 22526-4 0 8280
2 20442 98.5972 346.7038 0011669 280.6449 79.3421 14.30120276242933
UO-22
1 21575U 91050B 94260.74803762 .00000001 00000-0 14773-4 0 5345
2 21575 98.4283 333.3428 0008359 19.5123 340.6381 14.36931313166370
KO-23
1 22077U 92052B 94260.60791282 -.00000037 00000-0 10000-3 0 4273
2 22077 66.0822 86.4803 0015420 264.9756 94.9498 12.86287179 98678
AO-27
1 22825U 93061C 94261.24026932 -.00000005 00000-0 15790-4 0 3275
2 22825 98.6472 336.0840 0008396 304.1084 55.9297 14.27634336 50963
IO-26
1 22826U 93061D 94265.20906155 -.00000030 00000-0 58551-5 0 3260
2 22826 98.6469 340.0607 0008701 291.5298 68.4957 14.27739405 51531
KO-25
1 22830U 93061H 94261.20397519 .00000014 00000-0 22905-4 0 3320
2 22830 98.5472 332.3546 0010765 265.5648 94.4296 14.28063452 50973
22828
1 22828U 93061F 94261.69386811 .00000010 00000-0 21704-4 0 3044
2 22828 98.6420 336.6006 0009634 285.7967 74.2151 14.28066214 19120
NOAA-9
1 15427U 84123A 94264.78473792 .00000108 00000-0 81246-4 0 9612
2 15427 99.0391 316.3555 0014722 310.1811 49.8067 14.13644294503900
NOAA-10
1 16969U 86073A 94264.71043503 .00000025 00000-0 28636-4 0 8583
2 16969 98.5109 270.7745 0014197 49.6655 310.5763 14.24905697416243
MET-2/17
1 18820U 88005A 94264.84702047 .00000030 00000-0 13558-4 0 4058
2 18820 82.5428 191.6933 0015357 273.2351 86.7043 13.84721360335730
MET-3/2
1 19336U 88064A 94263.50790002 .00000051 00000-0 10000-3 0 3270
2 19336 82.5348 256.2229 0019482 27.1381 333.0750 13.16968720295806
NOAA-11
1 19531U 88089A 94264.86831799 .00000065 00000-0 59916-4 0 7799
2 19531 99.1796 256.1884 0011153 219.8719 140.1625 14.13017320308792
MET-2/18
1 19851U 89018A 94263.48156725 .00000012 00000-0 -27195-5 0 3270
2 19851 82.5102 67.9382 0014714 326.7609 33.2607 13.84371975280873
MET-3/3
1 20305U 89086A 94265.26027486 .00000044 00000-0 10000-3 0 1514
2 20305 82.5530 202.8546 0007809 46.2814 313.8946 13.04410592235554
MET-2/19
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1 20670U 90057A 94260.68464305 -.00000033 00000-0 -42409-4 0 8296
2 20670 82.5473 135.0161 0014451 248.4464 111.5145 13.84181599213418
FY-1/2
1 20788U 90081A 94265.07669375 -.00000027 00000-0 10000-4 0 1034
2 20788 98.8262 282.1036 0016870 102.6160 257.6893 14.01330748207271
MET-2/20
1 20826U 90086A 94262.53810013 .00000035 00000-0 17796-4 0 8389
2 20826 82.5206 70.9087 0013824 138.2251 221.9964 13.83589113200809
MET-3/4
1 21232U 91030A 94260.58744253 .00000050 00000-0 10000-3 0 7360
2 21232 82.5399 104.2812 0012941 320.4884 39.5272 13.16464714163513
NOAA-12
1 21263U 91032A 94264.63268759 .00000085 00000-0 57275-4 0 1883
2 21263 98.6110 290.2587 0012645 321.6371 38.3904 14.22448820174212
MET-3/5
1 21655U 91056A 94263.48785247 .00000051 00000-0 10000-3 0 7425
2 21655 82.5466 49.4259 0012649 325.0841 34.9446 13.16833670149002
MET-2/21
1 22782U 93055A 94260.60958337 .00000017 00000-0 22009-5 0 3377
2 22782 82.5444 133.2096 0023099 331.1116 28.8772 13.83014568 52867
POSAT
1 22829U 93061G 94261.70111181 -.00000006 00000-0 15528-4 0 3192
2 22829 98.6438 336.6264 0009543 287.0663 72.9463 14.28040464 51040
MIR
1 16609U 86017A 94263.91337372 .00002349 00000-0 38527-4 0 7684
2 16609 51.6465 67.4039 0002303 55.9412 304.1818 15.57092900490932
HUBBLE
1 20580U 90037B 94263.56201773 .00000403 00000-0 24959-4 0 5377
2 20580 28.4704 343.3027 0006270 8.3135 351.7553 14.90675622 43636
GRO
1 21225U 91027B 94263.40288782 .00001913 00000-0 38561-4 0 1425
2 21225 28.4631 290.9650 0003518 201.9854 158.0562 15.41277550 71647
UARS
1 21701U 91063B 94265.10692193 .00002274 00000-0 21972-3 0 5981
2 21701 56.9866 130.6744 0004615 113.8817 246.2705 14.96465254165445
/EX
```

1508. * SpaceNews 26-Sep-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 18:50:48 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc0926.1994@ampr.org>
Source record: 26777
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC0926
* SpaeNews 26-Sep-94 *

BID: $SPC0926

=========
SpaceNews
=========

MONDAY SEPTEMBER 26, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* MACHHOLTZ-2 NEWS *
====================
Astronomers are keeping a watchful eye on Machholtz-2, a comet discovered to be racing toward the Sun by an American scientist last month. Shortly after the comet was discovered, observers reported the comet had broken up in a manner similar to comet Shoemaker-Levy-9 before its impact with Jupiter in July, and there is some concern the fragments of comet Machholtz-2 could impact the Earth in the future. Five fragments have been spotted so far, and all are heading for Earth's orbit. However, astronomers warn it is extremely difficult to predict the long-term behavior of the comet fragments and advise the comet will be monitored closely.

* NOAA-11 FAILURE *
===================
Reliable sources report that NOAA-11's AVHRR failed at 23:30 UTC on 13-Sep-94. A brief report indicated that the fault appeared to be electrical. NESDIS personnel have been working diligently to solve the problem, but it seems that APT as well as high resolution images are no longer available from NOAA-11 because of this failure.

* AO-16 RELOAD COMPLETE *
=========================
As of 0330 UTC on 21-Sep-94, the AO-16 File Server is open and returned to general use. The AO-16 Command Team would like to thank everyone for their patience during this important "Preventive Maintenance" reload. Thanks go to the AO-16 Command Team consisting of WJ9F, WD0E, VK7ZBX, KB5MU, as well as NK6K and WB9ANQ.

[Info via Russ Platt, WJ9F]

* NASA NEWS VIA E-MAIL *
========================
NASA press releases and other information are available automatically by sending an Internet electronic mail message to domo@hq.nasa.gov. In the body of the message (not the subject line) users should type the words "subscribe press-release" (no quotes). The system will reply with a confirmation via E-mail of each subscription. A second automatic message will include additional information on the service. Questions should be directed to (202) 358-4043.

* MIR NEWS *
============
On 09-Sep-94 Malenchenko and Musabayev performed an EVA for the first time. The duration of the EVA was more than 4 hours (a reliable source even spoke about 5 hrs 2 mins.). During the pass in orbit 48915, between 1200 and 1207 UTC when Mir was VHF of observers in Europe, the cosmonauts reported the closure of the hatch at 1202 UTC. During this EVA they inspected the outside of the entire orbital complex, installed experimental materials on outside platforms for exposure to open space and removed other experiments of that kind for storage inside the complex. They repaired the damaged thermo-isolation layer on the transition section (P.Kh.O.) of which a 30x40cm piece had been torn away during the collision with Soyuz-TM17 in January 1994. The inspection made clear that the toughes of the freighter Progress-M24 during its second approach on 30-Aug-94 did not cause significant damage.

On 13-Sep-94 the cosmonauts worked in open space for a second time. The EVA lasted 6 hours and 1 minute between 0631 UTC (opening of the hatch) and 1232 UTC (closure of the hatch). The cosmonauts performed many minor repairs, replaced bolts, screws, etc. of platforms and equipment on the outer surface of the complex. They also spoke about an old antenna. Activities of that kind must be done now and then, but have been often neglected during EVA's due to more important matters. The cosmonauts also did some preparatory work aimed at the future transfer of the solar batteries from Kristall to Kvant-1. This transfer has been put back again to the beginning of 1995.

Radio communications during the EVAs were copied in Europe on a frequency somewhat lower than normal, 143.622 MHz, shifting by Doppler to 143.617 MHz. Listeners in Western-Europe, including the UK, who monitor MIR traffic during EVAs often experience heavy interference caused by cross-modulation from an airtraffic control frequency.

[Info via Chris v.d. Berg, NL-9165/A-UK3202]

* THANKS! *
============
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

7J1AJH N2RIF VK3DTO K4TXK/KL7 OA4PQ WB5PUM N6EGY W8QX

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16, LUSAT-OSCAR-19

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1509. Re: Ham-Space Digest V94 #268

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 20:24:24 UTC
From: xenolith@halcyon.COM
Message-ID: <199409232023.AA25852@halcyon.com>
Source record: 26859

>The uplink to RS-10 is on 2 meters. The downlink is on
>10 meters. Is it legal for a No-Code Tech to transmit
>to the satellite and have his/her signal transponded to
>10 meters? That is, can they use the satellite for QSOs?

Of course, the tech is only transmitting on 2m.

Same is true for even novices (one ham in Bellevue has his HEO sat station coupled to a 220Mhz repeater, so all (including novices) can work the satellites!

Same is true of coupled repeaters (say 2m and 10m).

In fact, sats are an excellent way to introduce techs to DX.

Certainly worked for me as a class B in the UK!

Kevin Purcell, N7WIM / G8UDP xenolith@halcyon.com 206/649-6489
Seattle dBug Mac Developers SIG organiser

1510. Re: SAREX Packet??? Maybe!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 22:02:36 UTC
From: winter@apple.com
Message-ID: <35vj9s$jje@apple.com>
Source record: 26860

In article <35gum4$7m2@ixnews1.ix.netcom.com>,
M.A. Lari <malari@ix.netcom.com> wrote:
>==
>Well, after spending many late nights waiting for the shuttle to pass
>over.. hearing nothing time after time, it's real nice to know that
>they "MIGHT" turn it on for the last few orbits...

You make it sound as though the SAREX folks were the ones who decided
to keep it off. Didn't you hear any of the discussions about power
conservation during the mission? Don't you think that the hams would
have turned on the packet robot in an instant if they'd been allowed to?

> Do the members of the amateur radio community have to go back to
>elementary school to be allowed to talk to the shuttle anymore?

That's an awfully snide comment. I suspect that you have never
personally attended a shuttle school contact. If you could see one
(perhaps you could volunteer to help a local school apply?), I think
you'd be so enchanted and swept up by the kids' excitement that you'd
see why NASA gives these contacts higher priority than freestyle
operations. Do you really think that you making a one-person contact is
more important than getting 50 or 100 kids excited about space and
amateur radio, *and* getting the event splashed all over the local media?

I never worked the shuttle myself until just a few months ago (a packet
contact on STS-59), but I was privileged to attend a school contact in
San Diego a couple of years ago, and it was one of the highlights of my
amateur radio life.

>At least they showed something on NASA SELECT. This time, even when
>they were doing something of interest, the videos were short if not
>at all. The Video Highlights were the only thing that even gave you a
>hint of what was going on up there.

I saw live footage of all of the experiments (LITE, Spartan, SPIFEX)
at one time or another, not just on the flight-day highlights shows.
And of course, even C-SPAN and CNN carried parts of the SAFER EVA.

>What happened to the cargo bay cameras when everyone up there was
>asleep?

Boy, I sure like those, too! I can easily stay up till one or two in
the morning watching those beautiful shots of the earth. Perhaps the
bandwidth on the NASA satellites was taken by other projects this time. :-(

>The last SAREX mission was only good for those who lived south of the
>28th para. because the orbiter never faced north anytime during that

>mission. I guess thats o.k. if you live in Texas, Florida or any of
>the southern states. I would have liked to have at least had a shot
>at getting a QSL card for the 25th aniversary of the APOLLO lunar
>landing. I realize that not everyone can make contact during a SAREX
>mission but it gets a little frustrating when you get cut entirely
>out of the loop.

I'm sure that NASA would be happy to accept your check for the extra
fuel necessary to put every mission into a 57-degree orbit. I don't
know the exact department to which you should send the money, but
probably the folks over on sci.space.shuttle could help you.

BTW, a 28-degree orbit does not mean that you have to be between
28N and 28S to see/hear the shuttle.

>If I sound a little bitter, it's only a small token of what many of us
>are feeling about the last few SAREX missions...

It's one thing to be frustrated; it's another to choose to get bitter
about it. I was also extremely frustrated during STS-65 because of the
low-inclination orbit. I copied one--count them, one--packet from the
SAREX robot during the *entire* mission. (And I didn't even write down
the time for an SWL card because it was early in the mission and I was
sure I'd copy more traffic later. C'est la vie.)

But for heaven's sake, I don't go around whimpering that NASA or SAREX
should adjust their missions for my benefit. I just say to myself, "Oh
well, there's always next time." And in my case, the next time (STS-64)
brought not only a packet contact, but my first-ever voice contact with
the shuttle (thank you, Susan!). So you lose some, you win some.

Amateur radio is full of challenging situations. (Go try making DXCC
with a porch-awning antenna sometime.) You can either learn to make
the best of a bad situation--which sometimes means totally failing to
get what you want--or you can keep lashing out unthinkingly. It's
your choice.

Patty

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

1511. SETI Project Downloads

Newsgroup: rec.radio.amateur.space
Date: 1994-09-23 22:25:45 UTC
From: MichaelMK@infoport.com
Message-ID: <37.47719237.InfoPort@infoport.com>
Source record: 26762

I am wondering if any of the transmissions received by the SETI project are
available for on-line downloading and analysis by amateur astronomers or
radio enthusiasts. Anyone aware of this possibility? Thanks.
****
Message sent from InfoPort Online Service
Denver, Colorado USA (303) 429-0291 or telnet infoport.com
A full service bulletin board using NovaLink Professional Software
****

1512. SAREX WWW HomePage and STS-64

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 00:50:19 UTC
From: hrsblackwell@hrs.gsfc.nasa.gov
Message-ID: <hrsblackwell-2309942050190001@n3kwu.gsfc.nasa.gov>
Source record: 26761

Hi,
The Goddard Amateur Radio Club assisted the Eisenhower Middle School in Laurel, MD
with a SAREX direct contact during STS-64. If you'd like to see photos from this effort as well
as a couple of sound bites recorded during the contact (students asking question then
astronaut responses), try the following URL:

http://hypatia.gsfc.nasa.gov/sarex_mainpage.html

I can tell you firsthand that the SAREX program is a good one and represents the best in
what Amateur Radio can provide in public service. Teachers, parents, and students that
participated, as well as members of our club were very much moved by the experience. Several
parents were in tears and the children (those that asked questions and those there to watch)
were estatic to say the least.

73

Jim Blackwell, N3KWU
President, GARC

1513. Ham-Space Digest V94 #268

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 08:10:51 UTC
From: 100407.436@compuserve.COM
Message-ID: <940924081051_100407.436_BHA26-2@CompuServe.COM>
Source record: 26763

RS 10 License.

About the problem of transmitting on 10Meters through RS10:
I am a no-code ham, and i wished to "test" some satellite communications before buying a better equipment. The easiest way was RS10.
I also wondered if it was legal. I looked for an answer in many books.. No answer !!
So i phoned the REF , and talked to them about my problem..
The answer was (in fact): You don't have the right, but you can do it..

This is a french point of view ! And that maybe explains why nobody deals with this problem in books.. So i made my QSO on RS10.. And heard some other no-code hams !

Laurent, F1JKJ

1514. Re: MIR INFO REQUESTED

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 08:26:07 UTC
From: serge@systech.mhs.oz.au
Message-ID: <1994Sep24.082607.713@systech.mhs.oz.au>
Source record: 26768

johanb01@TIGGER.STCLOUD.MSUS.EDU wrote:
: In article <2d.1778.599.0N8510A9@exchange.com>, bob.stanton@exchange.com (Bob Stanton) writes:
: >From: bob.stanton@exchange.exchange.com
: >To : all

...stuff deleted

: > My house is about 20' above sea level with some tall trees in
: > the front and back yards.
: > The TNC is a KPC3.
: >
: > I am transmitting on 144.49 and receiving on 145.55. I am
: > listening for and attempting to connect to R8MIR-1.
: >
: > I am running a Tandy 2500 SX/25 with PAKET 6.0 running.
: >
: >Does anyone have any ideas?
: >
: Mir does not run duplex like STS missions do.
: Set your X-crv to Xmit AND Rcv on 145.55. At least this was the way they
: were set up last time I tried them, and I have connected once.
: If they are runing duplex now, sorry for the wrong info.
: 73
: Brad

You will also need to connect to R0MIR-1 not R8MIR-1. I also believe
there is discussion of changing freqs. But as of 2 days ago, you can
do it with a 1/4 wave and handheld in Brisbane, AUSTRALIA
Regards,

Serge VK4BSB

1515. Tracking Prg for Ami?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 14:46:38 UTC
From: jamesb@clark.net
Message-ID: <361e4e$f8f@clarknet.clark.net>
Source record: 26764

I was just wondering if there is a sat tracking program for the Amiga computer? I have the A4000 and A2000. Mainl, I will be tracking the SATs with the A2000. Any info would help.

Thanks,

--
James "Alex" Brooks
ARS N4POE
{Packet Station}

1516. Ham Balloon Launch Info Sources?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 14:51:18 UTC
From: miles@mbs.telesys.utexas.edu
Message-ID: <miles-240994094750@slip-4-9.ots.utexas.edu>
Source record: 26765

Are there any ham-balloon folks on the net? If so, do you have upcoming
launches scheduled? Is there a central registry for this kind of
information? Thank you.

PS-The October 94 QST has a remarkable photo (page 102) of a balloon
bursting at high altitude.

```
= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
_ Miles Abernathy, N5KOB = I have a spelling checker.
| |__ miles@mail.utexas.edu = It came with my PC.
_| | POB 7580, Austin TX 78713 = It plane lee Marx four my review
\ * / University of Texas @ Austin = Miss steaks aye kin knot sea.
\/ tel. (512) 471-6521 U.S.A. = (from mini-JIR)
= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
```

1517. ARLK042 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 18:16:33 UTC
From: w1aw@arrl.org
Message-ID: <$arlk042.1994@ampr.org>
Source record: 26766
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK042
ARLK042 Keplerian data

ZCZC SK10
QST de W1AW
Keplerian Bulletin 42 ARLK042
From ARRL Headquarters
Newington, CT September 24, 1994
To all radio amateurs

SB KEP ARL ARLK042
ARLK042 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-68
1 99968U 94273.52881651 .00126891 00000-0 63979-4 0 33
2 99968 56.9988 77.8829 0009615 272.7810 87.2164 16.20171184 28
AO-10
1 14129U 83058B 94254.05030619 -.00000192 00000-0 10000-3 0 3080
2 14129 26.8972 308.5366 6028238 209.9975 94.5175 2.05881264 56585
RS-10/11
1 18129U 87054A 94263.50806321 .00000031 00000-0 16789-4 0 9588
2 18129 82.9207 258.3796 0013008 115.1045 245.1460 13.72341562362984
UO-11
1 14781U 84021B 94263.57473666 .00000043 00000-0 15101-4 0 7328
2 14781 97.7855 273.8325 0011504 330.5055 29.5500 14.69245930564319
RS-12/13
1 21089U 91007A 94261.15456134 .00000038 00000-0 24598-4 0 7304
2 21089 82.9220 302.5081 0028116 207.6788 152.2863 13.74046397181416
AO-13
1 19216U 88051B 94256.93865187 -.00000412 00000-0 10000-4 0 9649
2 19216 57.7380 231.2127 7232007 350.2215 0.9340 2.09725609 16371
UO-14
1 20437U 90005B 94260.24520782 .00000021 00000-0 25048-4 0 314
2 20437 98.5872 343.7577 0010412 283.6457 76.3562 14.29855283242741
AO-16
1 20439U 90005D 94261.20697721 .00000006 00000-0 19484-4 0 8296
2 20439 98.5961 346.0402 0010748 281.6298 78.3679 14.29909137242893
```

```
DO-17
1 20440U 90005E 94260.73242676 .00000023 00000-0 25767-4 0 8302
2 20440 98.5967 345.9264 0010797 282.1116 77.8842 14.30049101242843
WO-18
1 20441U 90005F 94260.77940046 .00000008 00000-0 20293-4 0 8327
2 20441 98.5964 345.9670 0011387 282.6574 77.3334 14.30022831242854
LO-19
1 20442U 90005G 94265.78873113 -.00000008 00000-0 13960-4 0 8294
2 20442 98.5970 351.1948 0011552 266.0234 93.9628 14.30120534243582
FO-20
1 20480U 90013C 94261.38526384 -.00000024 00000-0 11456-4 0 7264
2 20480 99.0514 35.6582 0541300 128.3652 236.7383 12.83227663216082
AO-21
1 21087U 91006A 94260.98935951 .00000094 00000-0 82657-4 0 5131
2 21087 82.9371 74.0296 0034792 183.1054 176.9892 13.74544644182336
UO-22
1 21575U 91050B 94260.74803762 .00000001 00000-0 14773-4 0 5345
2 21575 98.4283 333.3428 0008359 19.5123 340.6381 14.36931313166370
KO-23
1 22077U 92052B 94260.60791282 -.00000037 00000-0 10000-3 0 4273
2 22077 66.0822 86.4803 0015420 264.9756 94.9498 12.86287179 98678
KO-25
1 22830U 93061H 94265.68812821 -.00000013 00000-0 12261-4 0 3339
2 22830 98.5469 336.7424 0010694 251.0020 108.9997 14.28063562 51610
KO-25?
1 22828U 93061F 94266.17800239 .00000009 00000-0 21377-4 0 3052
2 22828 98.6422 341.0384 0009551 272.0845 87.9239 14.28066628 19760
IO-26
1 22826U 93061D 94265.20906155 -.00000030 00000-0 58551-5 0 3260
2 22826 98.6469 340.0607 0008701 291.5298 68.4957 14.27739405 51531
AO-27
1 22825U 93061C 94261.24026932 -.00000005 00000-0 15790-4 0 3275
2 22825 98.6472 336.0840 0008396 304.1084 55.9297 14.27634336 50963
PO-28
1 22829U 93061G 94261.70111181 -.00000006 00000-0 15528-4 0 3192
2 22829 98.6438 336.6264 0009543 287.0663 72.9463 14.28040464 51040
Mir
1 16609U 86017A 94265.83875454 .00002060 00000-0 34616-4 0 7691
2 16609 51.6457 57.7625 0002408 59.6646 300.4451 15.57101867491231

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
September 27, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1518. RE: Calling the shuttle (was Re: SAREX Status/Keps 9/12 at 11:00 UTC)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-24 18:22:35 UTC
From: pchien@ids.net
Message-ID: <362qg6$13m@paperboy.ids.net>
Source record: 26769

Congrats Patty!

And just a minor correction. Dick Richards's call sign is KB5SIW, and
if Susan was using the radio then he was the control operator with
her using his call. I heard Dick, Jerry and Blaine at various times
during the mission in voice, but I don't think they heard me.

I did make it quite clear to Dick Richards that I wanted him to hear
my call sign from orbit before they landed. Maybe that's why they
diverted their landing to 3000 miles away from me? ;)

Philip Chien KC4YER
no sig yet

In Article <35ohc8$a78@apple.com>
winter@apple.com (Patty Winter) writes:
>In article <354fkd$kmr@chnews.intel.com>,
>Thomas A. Boza~ <tboza@sedona.intel.com> wrote:
>>
>>I heard Susan, KB5IWS, from STS-64 on 145.55 last night making two differnet
>>QSOs.
>>
>>She did not call CQ, and From what I understand, "YOU" have to call CQ,
>>and they (Susan) will answer you.
>
>
>No, all you have to do is transmit your callsign *after* you hear
>signs of voice operations from the shuttle. The astronauts are trained
>by the SAREX folks to operate contest- or DXpedition-style. They call
>CQ briefly and then work through the resulting pileup. They'll only call
>CQ again if the pileup disappears (not likely :-)).
>
>NB: Susan Helms isn't a ham; she was using Dick Richards' callsign.
>I had the great pleasure of talking to her on Thursday--my first-ever
>voice contact with the shuttle.
>
>
>Patty
>
>--
>============================== Patty Winter ==============================
> Apple contractor Internet: winter@apple.com
> Sunnyvale, California AMPRNet: 44.4.4.44
> "Here I've been talking with the most intelligent people
> in the world, and I never even noticed." --Columbo

>================================== N6BIS ==================================
>

1519. Re: Ham Balloon Launch Info Sources?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-25 01:46:35 UTC
From: biekert@phoenix.phoenix.net
Message-ID: <362kpr$f57@dolphin.phoenix.net>
Source record: 26767

The Clear Lake Amateur Radio Club (CLARC) in SE Houston is planning a
balloon launch on OCT 9th.
It will carry 2m packet, 2m beacon, 10mdsb beacon 28.322.

As launch date approaches I'll post more information.

This launch is for NOSTS-1 (Near Outer Space Transportation System)

73 de Bob KA5GLX Vice President of CLARC

--
Robert E. Biekert KA5GLX Houston, Texas
Email: biekert@phoenix.phoenix.net

1520. ANS-267 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-09-25 18:43:11 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-267.01.1994@ampr.org>
Source record: 26785
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-267.01
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 260.01 FROM AMSAT HQ
SILVER SPRING, MD SEPTEMBER 24, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-267.01

Weekly OSCAR Status Reports: 24-SEP-94

AO-13: Current Transponder Operating Schedule:
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Blon/Blat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
==========
[G3RUH/DB2OS/VK5AGR]

AO-16: WD0E reports that as of 03:30 UTC 21-SEP-94 the AO-16 File Server is open and returned to general use. The AO-16 Command Team would like to thank everyone for their patience during this important "Preventive Maintenance" software reload. [WD0E].

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1521. re Trking Pgm for Ami

Newsgroup: rec.radio.amateur.space
Date: 1994-09-25 22:13:13 UTC
From: John@slip___.telnet1.queensu.ca
Message-ID: <364slp$ghk@knot.queensu.ca>
Source record: 26770

Product "SATTRACK" at Aminet in Sci/misc directory - excellent -
you need to send 'keyware' registration fee to Randy Stackhouse
in Fl - very psd with product - heard the ham sats, and SAREX
73 John VE3NFK

--

John Turgoose Kingston, Ontario
john@slip___.telnet1.queensu.ca Canada
or- john.turgoose@kosone.com North America

1522. Re: Tracking Prg for Ami?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 03:19:30 UTC
From: coyote@fx.net
Message-ID: <365ek2$nqa@world.fx.net>
Source record: 26771

James Alex Brooks (jamesb@clark.net) wrote:
: I was just wondering if there is a sat tracking program for the Amiga
: computer? I have the A4000 and A2000. Mainl, I will be tracking the
: SATs with the A2000. Any info would help.

: Thanks,

: --
: James "Alex" Brooks
: ARS N4POE
: {Packet Station}

Try looking in the pub/hamradio/amiga directory(if I remember
correctly) at oak.oakland.edu. I saw what appeared to be a satellite
tracking program for amigas. If not there, it may have been in a
satellite directory. Till later, Si B.

1523. Voyager CD.

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 06:45:00 UTC
From: pat.swovelin@ledge.com
Message-ID: <89A8555.01E9000048.uuout@ledge.com>
Source record: 26773

My question is: where can I get an audio copy, preferrably on CD, of the recording that was placed in the Voyager spacecraft. Now I know this isn't the NASA store (if one exists), but I thought it would be a good place to ask/start.

Thanks in advance for your help with this earth shaking question, such as it is...

Blue Sky,
Pat

1524. Mac sat antenna-positioning program ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 09:17:11 UTC
From: dpalik@violet.ccit.arizona.edu
Message-ID: <1994Sep26.021711.1@violet.ccit.arizona.edu>
Source record: 26772

Is there a Macintosh satellite computer-tracking and
antenna-control/positioning program out there anywhere ?

Thanks,

Don Palik
dpalik@ccit.arizona.edu

1525. Orbital elements for Milsats ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 09:21:25 UTC
From: dpalik@violet.ccit.arizona.edu
Message-ID: <1994Sep26.022125.1@violet.ccit.arizona.edu>
Source record: 26774

Is there a source of orbital elements for the Milsats (FLEETSATs, DSCS IIIs, etc.) out there anywhere ?

I have seen elements for AMSATs, TV sats, even the Space Shuttle, but never the Milsats.

Thanks,

Don Palik
dpalik@ccit.arizona.edu

1526. The HamSat Handbook- has the satellite Freqs ur looking for

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 13:53:27 UTC
From: wwg@coutts.UUCP
Message-ID: <403@coutts.UUCP>
Source record: 26792
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

I've seen many posts over the months requesting satellite frequencies of one satellite or another. I just got my copy of "The HamSat Handbook" by Anthony R. "Tony" Curtis, K3RXK this morning. Flipping through this book I am pleased to see an up to date (Feb 1993) description of all OSCAR satellites, their history etc.

Chapter 1 covers the early history, titled "The First Space Satellites".

Chapter 2 "The Story of Orbital Satellites Carrying Amateur Radio" discusses the history of all OSCARs to 1993+.

Chapter 3 is devoted to modes and frequencies used by the satellites. (This would be the reference material that many are seeking, although chapter 2 also provides a fair bit of good information).

Chapters 4 and 5 covers Space stations and SAREX.

And finally chapter 6 covers Balloons, meteors and EME etc.

To recap, if anyone wants more information on what's available up there, I think that this is one very good source for amateur radio enthusiasts.

The HamSat Handbook, (I'm not affiliated, just a satisfied
by Tony Curtis K3RXK owner of the book!)
ISBN 0-936653-35-3 ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
$19.95 U.S., ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
Tiare Publications
PO Box 493
Lake Geneva, Wisconsin 53147 USA

Warren W. Gay VE3WWG John Coutts Library Services Limited
wwg@coutts.UUCP Niagara Falls, Ontario, Canada
(or wwg%coutts@uunet.ca, wwg%coutts@uunet.uu.net)

1527. Oscar 10

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 15:03:17 UTC
From: t1terryb@cascade.ens.tek.com
Message-ID: <366nrl$ev@cascade.ens.tek.com>
Source record: 26781

Is oscar 10 still working? This weekend according to my stsorbit it would of had a tremendous coverage of the northern hemisphere and I was wondering if it is still operational.

Got to work my first few qso's on RS-12. Was a kick. Like being in a contest with only a few minutes left. Of course, keeping my hand off the tuning know while transmitting was something I had to learn.

Terry, KI7M

1528. Re: Packet Radio (SAREX)!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 18:08:06 UTC
From: rtm@newton.apple.com
Message-ID: <rtm-260994100806@kip-48.apple.com>
Source record: 26779

Gerry, Mike-

The SAREX crew does a great job, and provides us with a lot of challenges, some of them unintended.

On the problem of 28 degree orbits, I took this as a challenge, and after running predictions for my location in northern CA (37.317302 N 122.055194 W) I got up in the middle of the night for many nights for "good" 9 degree elevation passes. I learned a lot about my equipment and how to best use it. I also met a number of other hams in the area and in Southern California who were trying to work the Shuttle. I managed to make contact, with simple equipment, after a lot of work.

The problem with this last mission (IMHO) was one of not setting expectations properly (and early). I didn't see any word preflight or early in the flight that SAREX activity was going to be constrained due to power budgets- I only saw this very late in the flight.

What I'd appreciate seeing, either preflight or very early in the flight, would be a SAREX mission profile, posting information such as expected MET/orbit for deploying SAREX, expected operation (e.g. lotsa voice during the day and packet during sleep periods), when SAREX will be restowed, and for us MacSPOC users, which windows SAREX will be using.

I'm looking forward to the next mission in October-

--
Bob Martin * rtm@newton.apple.com
N6MZV * N6MZV @ N0ARY.#NOCAL.CA.USA.NOAM

1529. Need file x-fer help!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 19:57:27 UTC
From: coyote@fx.net
Message-ID: <367937$41r@world.fx.net>
Source record: 26780

I'm having problems with my stsorbit programs. The programs won't read files that I ftp to my local unix machine, and then z-modem to my pc. I can do a screen capture, and after editing out the footers on each page, the programs can find the kelp data ok. I can edit the kelp data so that the files look identical, but the programs can only read the kelp data transfered by the screen capture mode. Anybody know whats happening here? Any help would be greatly appreciated. Till later, Si B.

1530. Re: Mac sat antenna-positioning program ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-26 22:55:29 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <9409262255290015@g0oanint.demon.co.uk>
Source record: 26782

In article <1994Sep26.021711.1@violet.ccit.arizona.edu>,
dpalik@violet.ccit.arizona.edu writes:

>
> Is there a Macintosh satellite computer-tracking and
> antenna-control/positioning program out there anywhere ?
>
> Thanks,
>
> Don Palik
> dpalik@ccit.arizona.edu
Hello Don,

Try "OrbiTrack," it's a shareware sat tracking programme for the Mac
and includes rotor control using the KR-101 interface.

You can download a copy from,

ftp.demon.co.uk /pub/ham/mac

You'll also find a pretty large selection of other Ham programmes for
the Mac in the same directory.

Regards,

Sean.

1531. Re: Voyager CD.

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 00:58:04 UTC
From: micron3@aol.com
Message-ID: <367qms$cj3@newsbf01.news.aol.com>
Source record: 26783

In article <89A8555.01E9000048.uuout@ledge.com>, pat.swovelin@ledge.com (PAT SWOVELIN) writes:

>My question is: where can I get an audio copy, preferrably on CD, of the >recording that was placed in the Voyager spacecraft.

You might try Tiger Software at 800-238-4437. A catalog I received from them listed such a CD. It is titled Murmers of Earth and comes in DOS and Mac versions for $39.95 plus S&H. I don't work for the folks nor have I ordered anything from them so can't recommend them either way.

> Now I know this isn't the NASA store (if one exists)
They do in Houston. Had some fun stuff in the store.

Good Luck,
Terry KJ7F

1532. AMSAT Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 03:01:08 UTC
From: martinsan@aol.com
Message-ID: <3681tk$fa9@newsbf01.news.aol.com>
Source record: 26784

Does anyone know of any other newsgroups or mailing lists run by AMSAT? I was only able to find this one and a mailing list specifically for distribution of kep's. Thanks. ...Marty WB9EVH

1533. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 09:06:50 UTC
From: caralt@gaig.upc.es
Message-ID: <368nbaINNruq@diable.upc.es>
Source record: 26795

[No readable article body recovered]

1534. Where is MacSpoc ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 09:33:05 UTC
From: dpalik@milori.ccit.arizona.edu
Message-ID: <1994Sep27.023305.1@milori.ccit.arizona.edu>
Source record: 26794

Where can I find MacSpoc ?

Don Palik
dpalik@ccit.arizona.edu

1535. Re: NOAA 11 problems ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 12:58:10 UTC
From: mklee@actrix.gen.nz
Message-ID: <mklee.9.0000F83A@actrix.gen.nz>
Source record: 26786

In article <93.1269.7587.0NFB3223@woodybbs.com> geoff.kennedy@woodybbs.com (Geoff Kennedy) writes:
>Subject: NOAA 11 problems ?
>From: geoff.kennedy@woodybbs.com (Geoff Kennedy)
>Date: Wed, 21 Sep 94 00:48:00 -0500

> NOAA 9 has been re-activated, and NOAA 10's APT (not sure about the
>rest of the stuff available) has been turned off, probably because it is
>conflicting with NOAA 12.

Yes, NOAA 10 & 12 are almost side-by-side now, and only approximately 3 minutes apart.

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

1536. Two-Line Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 13:01:00 UTC
From: mklee@actrix.gen.nz
Message-ID: <mklee.10.00010451@actrix.gen.nz>
Source record: 26787

The last set of two-line elements from Dr T Kelso was #464, which was quite a while ago.

Have I been missing out?

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

1537. Mirage mast mounted preamps

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 13:16:53 UTC
From: ROBERTSM@JSC.MIL
Message-ID: <se87e320.013@JSC.MIL>
Source record: 26788

Has anyone used the new Mirage mast mounted preamps for OSCAR use?
If so, what is your opinion compared with other units?
Thanks, Mel W3MR
robertsm@jsc.mil

1538. 2-line keps

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 13:30:05 UTC
From: dmgillah@mtu.EDU
Message-ID: <199409271330.JAA00840@mtu.edu>
Source record: 26789

Howdy! I was wondering if anyone knows where I might anonymous FTP to for
up-to-date 2-line keps data. Right now my local PBBS is down, and I had
a hunch that maybe they're available on the internet...

73s
--

****
* Talk to ya, Dave Attention all Skydivers: *
* Until you've jumped *
* Michigan Technological University into pitch blackness *
* Where it's too &@#% cold! at 1250 feet with 80 *
* dmgillah@mtu.edu pounds of combat gear, *
* kb8por@w8yy.upmi.mi.usa.na YOUR STILL A LEG !!! *
****

1539. Re: 2-line keps

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 17:20:19 UTC
From: johnsotc@sd2.af.mil
Message-ID: <369k8j$a86@blackbird.afit.af.mil>
Source record: 26790

In article <199409271330.JAA00840@mtu.edu>, dmgillah@mtu.EDU (David Gillahan) writes:
|> Howdy! I was wondering if anyone knows where I might anonymous FTP to for
|> up-to-date 2-line keps data. Right now my local PBBS is down, and I had
|> a hunch that maybe they're available on the internet...
|>
|> 73s
|> --
|> **
|> * Talk to ya, Dave Attention all Skydivers: *
|> * Until you've jumped *
|> * Michigan Technological University into pitch blackness *
|> * Where it's too &@#% cold! at 1250 feet with 80 *
|> * dmgillah@mtu.edu pounds of combat gear, *
|> * kb8por@w8yy.upmi.mi.usa.na YOUR STILL A LEG !!! *
|> **

Try archive.afit.af.mil

See the pub/space directory.

Tom Johnson

1540. Re: Where is MacSpoc ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 18:53:01 UTC
From: tstader@aol.com
Message-ID: <369pmd$b4@newsbf01.news.aol.com>
Source record: 26791

In article <1994Sep27.023305.1@milori.ccit.arizona.edu>,
dpalik@milori.ccit.arizona.edu writes:

I have the OK to upload the "demo" version for Dan Adamo... I'll place at
ucsd.edu in the next day or so.

Dan can be reached on the net as:

Adamod@aol.com

Terry Stader - KA8SCP
AOL Ham Radio Club Host

1541. Re: Two-Line Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 20:46:13 UTC
From: randall@cygnus.sunydutchess.edu
Message-ID: <36a0al$ujh@admaix.sunydutchess.edu>
Source record: 26799

Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
: The last set of two-line elements from Dr T Kelso was #464, which was quite a
: while ago.

: Have I been missing out?

: Mun-Kong Lee
: mklee@actrix.gen.nz
: Raumati Beach
: New Zealand

Yhea, I'm missing out too! There the only ones that seem to work
properly!

Tom

1542. ARLK043 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-09-27 22:37:46 UTC
From: w1aw@arrl.org
Message-ID: <$arlk043.1994@ampr.org>
Source record: 26796
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK043
ARLK043 Keplerian data

ZCZC SK11
QST de W1AW
Keplerian Bulletin 43 ARLK043
From ARRL Headquarters
Newington, CT September 27, 1994
To all radio amateurs

SB KEP ARL ARLK043
ARLK043 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-68
1 99968U 94273.52881651 .00126891 00000-0 63979-4 0 33
2 99968 56.9988 77.8829 0009615 272.7810 87.2164 16.20171184 28
AO-10
1 14129U 83058B 94254.05030619 -.00000192 00000-0 10000-3 0 3080
2 14129 26.8972 308.5366 6028238 209.9975 94.5175 2.05881264 56585
RS-10/11
1 18129U 87054A 94268.02843046 .00000024 00000-0 97667-5 0 9605
2 18129 82.9213 255.0378 0013217 103.9971 256.2651 13.72341657363606
UO-11
1 14781U 84021B 94268.00144558 .00000063 00000-0 18490-4 0 7333
2 14781 97.7853 278.0514 0011286 316.0016 44.0298 14.69247006564960
RS-12/13
1 21089U 91007A 94267.56262762 .00000059 00000-0 46652-4 0 7327
2 21089 82.9206 297.7546 0028497 189.2278 170.8360 13.74046986182291
AO-13
1 19216U 88051B 94268.85908553 -.00000252 00000-0 10000-4 0 9673
2 19216 57.7254 229.1074 7234287 351.1080 0.8163 2.09723820 16623
UO-14
1 20437U 90005B 94267.73275563 -.00000025 00000-0 73156-5 0 330
2 20437 98.5870 351.1405 0010299 260.0414 99.9603 14.29855473243814
AO-16
1 20439U 90005D 94267.78457414 -.00000009 00000-0 13585-4 0 8311
2 20439 98.5958 352.5326 0010595 261.0681 98.9301 14.29909495243836
```

```
DO-17
1 20440U 90005E 94267.72918637 -.00000008 00000-0 13802-4 0 8328
2 20440 98.5966 352.8356 0010733 260.0751 99.9213 14.30049404243845
WO-18
1 20441U 90005F 94267.70631895 .00000001 00000-0 17527-4 0 8347
2 20441 98.5963 352.8068 0011218 261.0131 98.9784 14.30023280243841
LO-19
1 20442U 90005G 94265.78873113 -.00000008 00000-0 13960-4 0 8294
2 20442 98.5970 351.1948 0011552 266.0234 93.9628 14.30120534243582
FO-20
1 20480U 90013C 94267.85666911 -.00000043 00000-0 -32743-4 0 7289
2 20480 99.0534 40.9163 0541308 113.7310 252.1529 12.83227496216915
AO-21
1 21087U 91006A 94266.95835898 .00000094 00000-0 82657-4 0 5155
2 21087 82.9375 69.6089 0035249 166.5749 193.6352 13.74545229183152
UO-22
1 21575U 91050B 94267.71132160 .00000021 00000-0 21627-4 0 5366
2 21575 98.4274 340.1583 0008064 359.4526 0.6643 14.36932334167373
KO-23
1 22077U 92052B 94267.83874780 -.00000037 00000-0 10000-3 0 4292
2 22077 66.0815 71.3389 0015476 263.7115 96.2142 12.86287606 99609
KO-25
1 22830U 93061H 94265.68812821 -.00000013 00000-0 12261-4 0 3339
2 22830 98.5469 336.7424 0010694 251.0020 108.9997 14.28063562 51610
KO-25?
1 22828U 93061F 94266.17800239 .00000009 00000-0 21377-4 0 3052
2 22828 98.6422 341.0384 0009551 272.0845 87.9239 14.28066628 19760
IO-26
1 22826U 93061D 94265.20906155 -.00000030 00000-0 58551-5 0 3260
2 22826 98.6469 340.0607 0008701 291.5298 68.4957 14.27739405 51531
AO-27
1 22825U 93061C 94267.75824516 -.00000007 00000-0 15224-4 0 3297
2 22825 98.6459 342.5288 0008049 282.3616 77.6664 14.27634788 51892
PO-28
1 22829U 93061G 94267.72677565 .00000005 00000-0 19751-4 0 3216
2 22829 98.6432 342.5879 0009344 267.5753 92.4353 14.28041074 51902
Mir
1 16609U 86017A 94268.85516121 .00002550 00000-0 41216-4 0 7709
2 16609 51.6473 42.6618 0002630 67.9646 292.1626 15.57121756491705

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Saturday,
October 1, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1543. Re: AMSAT Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 03:04:56 UTC
From: wardf@delphi.com
Message-ID: <RG73All.wardf@delphi.com>
Source record: 26793

MartinSan <martinsan@aol.com> writes:

>Does anyone know of any other newsgroups or mailing lists run by AMSAT? I
>was only able to find this one and a mailing list specifically for
>distribution of kep's. Thanks. ...Marty WB9EVH

Marty, I logged on here hoping to find some newsgroups myself. I'd really
appreciate having any you find passed along. I havn't found the one you
mention for keps up-dateds yet. It would be nice to get really up to the
minute data for the SAREX missions.
73 de Wardf@Delphi.com (KB1AJF @ WB1CQO.CT.USA.NOAM

1544. ufo's

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 04:12:52 UTC
From: GitarRed@infoport.com
Message-ID: <25.47724951.InfoPort@infoport.com>
Source record: 26797

Are there any UFO forums on the Internet?
****
Message sent from InfoPort Online Service
Denver, Colorado USA (303) 429-0291 or telnet infoport.com
A full service bulletin board using NovaLink Professional Software
****

1545. re: Mac sat antenna-positioning program ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 04:48:14 UTC
From: kelly@tomcat1.tbe.COM
Message-ID: <9409280448.AA22606@tomcat1.tbe.com>
Source record: 26804

> Is there a Macintosh satellite computer-tracking and
> antenna-control/positioning program out there anywhere ?
>
> Thanks,
>
> Don Palik
> dpalik@ccit.arizona.edu

```
kelly 8% ftp -i oak.oakland.edu
Connected to oak.oakland.edu.
220 oak.oakland.edu FTP server (Version wu-2.4(2) Sun Aug 14 14:49:48 EDT 1994)
ready.
[ much deleted ]
ftp> pwd
257 "/pub/hamradio/mac/space" is current directory.
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 1471
-rwxr-xr-x 1 wy1z barc 67086 Mar 29 1994 MACSAT.USERS.GUIDE.HQX
-rwxr-xr-x 1 wy1z barc 297011 Mar 29 1994 MACSAT30.DEMO.SIT.HQX
-rwxr-xr-x 1 wy1z barc 408059 Mar 17 1994 OrbiTrack-2.1b14-folder.se
a.hqx
-rwxr-xr-x 1 wy1z barc 97671 Feb 13 1992 dove.hqx
-rwxr-xr-x 1 wy1z barc 3976 Feb 13 1992 dove.readme
-rwxr-xr-x 1 wy1z barc 75907 Mar 17 1994 galaxy.txt.sea.hqx
-rwxr-xr-x 1 wy1z barc 134892 Mar 17 1994 macastro.sea.hqx
-rwxr-xr-x 1 wy1z barc 50008 Mar 17 1994 macdove.sea.hqx
-rwxr-xr-x 1 wy1z barc 61460 Mar 15 1994 sat-quizzer-03.hqx
-rwxr-xr-x 1 wy1z barc 257314 Mar 15 1994 sat-trak-102.hqx
226 Transfer complete.
ftp>
```

I've tried sat-trak-102 and OrbiTrack. Couldn't master the Keps for SatTrack without reading the documentation, but had no trouble with OrbiTrack. I don't think either will automatically drive your rotators.

73, David N4HHE
dkelly@nebula.tbe.com

1546. Re: 2-line keps

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 07:37:36 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <Cwtx6p.D66@bbc.co.uk>
Source record: 26798

David Gillahan (dmgillah@mtu.EDU) wrote:
: Howdy! I was wondering if anyone knows where I might anonymous FTP to for
: up-to-date 2-line keps data. Right now my local PBBS is down, and I had
: a hunch that maybe they're available on the internet...

: 73s
: --
: **
: * Talk to ya, Dave Attention all Skydivers: *
: * Until you've jumped *
: * Michigan Technological University into pitch blackness *
: * Where it's too &@#% cold! at 1250 feet with 80 *
: * dmgillah@mtu.edu pounds of combat gear, *
: * kb8por@w8yy.upmi.mi.usa.na YOUR STILL A LEG !!! *
: **

try archive.afit.afi.mil

john b
john.boyer@rd.eng.bbc.co.uk

1547. Re: Where is MacSpoc ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 09:12:34 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <9409280912340017@g0oanint.demon.co.uk>
Source record: 26800

In article <1994Sep27.023305.1@milori.ccit.arizona.edu>,
dpalik@milori.ccit.arizona.edu writes:

>
> Where can I find MacSpoc ?
>
> Don Palik
> dpalik@ccit.arizona.edu

You can find a copy of MacSPOC v1.1 (shareware) at,

ftp.demon.co.uk /pub/ham/mac

or directly from the author Daniel R. Adamo
<adamo@kn5f.jsc.nasa.gov>.

You also find quite a large selection of other Macintosh Ham software
at the DEMON FTP site.

Regards,

Sean.

1548. Re: AMSAT Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 21:34:12 UTC
From: garym@alsys.com
Message-ID: <Cwuzx1.DKq@alsys.com>
Source record: 26801

In <RG73AlI.wardf@delphi.com> wardf@delphi.com writes:
>Marty, I logged on here hoping to find some newsgroups myself. I'd really
>appreciate having any you find passed along.

I've never seen any AMSAT newsgroups, I can say with near certainty that there aren't any. However, there are several mailing lists, KEPS, SAREX, AMSAT-BB, send mail to listserv@amsat.org for more information.

>I havn't found the one you
>mention for keps up-dateds yet. It would be nice to get really up to the
>minute data for the SAREX missions.

I run a mailing list dedicated to distributing Shuttle Keps. To subscribe write to "listserv@alsys.com", include at the beginning of your message the command:

subscribe elements Your Full Name

To just get information about the list send the info command to the listserver:

info elements

--GaryM

Gary Morris Internet: elements-request@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128

1549. APT Equipment Suggestions??

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 22:20:10 UTC
From: smbourne@covina.lightside.com
Message-ID: <smbourne.26.001656B7@covina.lightside.com>
Source record: 26663

I'm thinking about buying some hardware to get NOAA/METOR APT
(and maybe GEOS/METEOSTAT) transmissions and I'm trying to decide on which
hardware is good.

I don't know anyone that is doing this, so I'm looking here.

I've gotten catologs from Vanguard, Quorum and OFS Weatherfax. Are there
others that I should know about? Any experience (good or bad) with any of
these? How about sources of used equipment.

Any suggestions or pointers will be greatlt appreciated!

Thanks,

Scott
Azusa, CA

1550. Re: AMSAT Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 22:35:09 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Cwv2qM.4K8@netcom.com>
Source record: 26810

wardf@delphi.com wrote:
: MartinSan <martinsan@aol.com> writes:
:
: >Does anyone know of any other newsgroups or mailing lists run by AMSAT? I
: >was only able to find this one and a mailing list specifically for
: >distribution of kep's. Thanks. ...Marty WB9EVH
:
: Marty, I logged on here hoping to find some newsgroups myself. I'd really
: appreciate having any you find passed along. I havn't found the one you
: mention for keps up-dateds yet. It would be nice to get really up to the
: minute data for the SAREX missions.
: 73 de Wardf@Delphi.com (KB1AJF @ WB1CQO.CT.USA.NOAM
:

Try archive.afit.af.mil for current TLEs, pub/space.

Bill Eareckson
eareckso@netcom.com

1551. Shuttle Audio Re-broadcasting

Newsgroup: rec.radio.amateur.space
Date: 1994-09-28 23:11:41 UTC
From: ve9bm@nbnet.nb.ca
Message-ID: <ve9bm.27.000880D5@nbnet.nb.ca>
Source record: 26661

Hi
I am posting this message on behalf of a non internet ham who would love to obtain permission from NASA to re-broadcast mission audio via VHF on a local repeater.
Can anybody please give me a name(s) of people he could contact to obtain permission to do this.
Thanks

73 de Brent VE9BM

1552. Re: AMSAT Newsgroups

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 00:55:11 UTC
From: martinsan@aol.com
Message-ID: <36d39f$rku@newsbf01.news.aol.com>
Source record: 26802

In article <RG73AlI.wardf@delphi.com>, wardf@delphi.com writes:

Try the following, let me know if you find anything.....

ELEMENTS: Shuttle Keplerian Elements Mailing List

List Title: ELEMENTS: Shuttle Keplerian Elements Mailing List
List Owner or Contact: Gary Morris, elements-request@alsys.com

To subscribe to this list, send e-mail to LISTSERV@alsys.com; in the body of the message, type SUBSCRIBE ELEMENTS followed by your real name. For example: SUBSCRIBE ELEMENTS Jane Q. User.

To unsubscribe from this list, send the command UNSUBSCRIBE ELEMENTS in e-mail to LISTSERV@alsys.com.

Send all other list-related commands to LISTSERV@alsys.com. For assistance, send the command HELP.

This list is read-only; you are not permitted to post articles to the list.

This mailing list is "edited"; this means that one or more humans must approve all articles for publication. When you submit an article, it is reviewed by a human (or humans) who determine whether or not the article will be distributed to the list.

This mailing list is "moderated"; that means that one or more human beings monitors the flow of the list traffic and makes an effort to keep conversations topical. While virtually all lists have a set number of topics to which conversations should apply, moderated lists are more strict in their interpretations of the guidelines. To be a good member of a moderated list, do not go outside the topics of the list without first okaying it with the moderator(s).

This mailing list is echoed to the USENET newsgroups, sci.space.news, rec.radio.info, and rec.radio.amateur.space. You may find that participating in the list by reading it with the America Online USENET Newsgroups reader will be a more rewarding experience than participating over e-mail. To participate over USENET, use keyword NEWSGROUPS to go to the America Online USENET Newsgroups reader. Then click on the "Expert Add" button and supply the newsgroup name (sci.space.news, rec.radio.info, or rec.radio.amateur.space) when asked.

Keywords: space, aerospace, shuttle

Description:
The purpose of the mailing list is to get Shuttle elements out as quickly

as possible during shuttle flights. Only tracking data (elements) are sent to the list. There are no flight announcements, shuttle information or discussion on the list, since that information is available from several other sources. You will receive pre-launch predicted elements and post launch elements based on either Shuttle computer state vector data or on NORAD radar tracking data. The data is primarily Two-Line Element Sets, but also some AMSAT format element sets.

The list language is English.

1553. AEA DSP-1232 problem

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 02:04:07 UTC
From: rdhoughton@vms4.sci.csupomona.edu
Message-ID: <1994Sep28.190407.1@clstcs>
Source record: 26803

I would like to hear from anyone who has successfully made the STEP command work on an AEA DSP-2232 or DSP-1232 multi-mode controller. I have ver. 7.00 firmware dated December 1, 1993. AEA says this function works as of ver. 7.00 but I've had no luck.

Thanks in advance,

Bob KC6LVG

P.S. If you have tried and failed, I'd still like to hear from you.

1554. Radio astromony?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 06:33:13 UTC
From: dcb@tauon.ph.unimelb.edu.au
Message-ID: <36dn39$bab@ariel.ucs.unimelb.EDU.AU>
Source record: 26805

I'm just interested in sites with information on Radio Astronomy.

If you know of any interesting ones especially sites with details
on radio observations of Jupiter during the comet impact could
you let me know?

Thanks

David
--

David Bell |E-mail: dcb@electron.ph.unimelb.edu.au
School of Physics |Phone : +61 3 344 5451
The University of Melbourne |Fax : +61 3 344 4783
Parkville, Victoria, AUST, 3052 |

1555. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 07:43:53 UTC
From: caralt@gaig.upc.es
Message-ID: <36dr7pINNn48@diable.upc.es>
Source record: 26806

[No readable article body recovered]

1556. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 07:45:42 UTC
From: caralt@gaig.upc.es
Message-ID: <36drb6INNn48@diable.upc.es>
Source record: 26807

[No readable article body recovered]

1557. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 07:52:37 UTC
From: caralt@gaig.upc.es
Message-ID: <36dro5INNn48@diable.upc.es>
Source record: 26808

[No readable article body recovered]

1558. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 07:54:21 UTC
From: caralt@gaig.upc.es
Message-ID: <36drrdINNo02@diable.upc.es>
Source record: 26809

[No readable article body recovered]

1559. Re: APT Equipment Suggestions??

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 09:36:58 UTC
From: boyer@rd.eng.bbc.co.uk
Message-ID: <CwvxDn.72I@bbc.co.uk>
Source record: 26662

Scott M Bourne (smbourne@covina.lightside.com) wrote:
: I'm thinking about buying some hardware to get NOAA/METOR APT
: (and maybe GEOS/METEOSTAT) transmissions and I'm trying to decide on which
: hardware is good.

: I don't know anyone that is doing this, so I'm looking here.

: I've gotten catologs from Vanguard, Quorum and OFS Weatherfax. Are there
: others that I should know about? Any experience (good or bad) with any of
: these? How about sources of used equipment.

: Any suggestions or pointers will be greatlt appreciated!

: Thanks,

: Scott
: Azusa, CA

There is a UK company called timestep. I have thier prosat2 board and
proscan receiver. Works really well. I'll post a pic on a.b.p.misc if you
like. Don't know if they sell in the US. Mail me if you want thier uk address.

John B
john.boyer@rd.eng.bbc.co.uk

1560. HELP - info about packet (satelite) Greenland - Europe (Internet)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 20:49:36 UTC
From: m8827@abc.se
Message-ID: <CwwsIp.I94@abc.se>
Source record: 26666

Sorry about this flaky request, but my internetsource is using a editor
not compatible with the comm-lines (i.e. call UNIX - cu).

Have been sysadm for Greenland School of Commerce some years back,
a post a friend has today. He wants Internet (which he had in Denmark)
but at 3$/min it's a bit costly even with email for a small college in
the arctics. Is it possible to run a packet radio or cheap satellite
(amateur satellite) hookup to Internet today, and wat is needed to
do it. The place, Nuuk/Godthaab, is at aprox. 65 deg. north.

Greenland has it's own Internet domain, even if noone is using it today.

Please mail me your responces, since I not using this source to often,
but in the process of making a new gate with local netnews.

Lars Magnusson
(larsm@sk.sema.se / postmaster@sema.se)

1561. Re: Ham-Space Digest V94 #268

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 20:51:37 UTC
From: dtiller@cscsun.rmc.edu
Message-ID: <CwwsM2.H96@cscsun.rmc.edu>
Source record: 26664

Laurent Ferracci (100407.436@compuserve.COM) wrote:
: RS 10 License.

: About the problem of transmitting on 10Meters through RS10:
: I am a no-code ham, and i wished to "test" some satellite communications before
: buying a better equipment. The easiest way was RS10.
: I also wondered if it was legal. I looked for an answer in many books.. No
: answer !!
: So i phoned the REF , and talked to them about my problem..
: The answer was (in fact): You don't have the right, but you can do it..

IF you were under the FCC's jurisdiction then whoever the REF is lied to you.
You have every "right" to use RS-10, as long as you adhere to the limitations
of your license class for transmissions leaving your antenna. If RS-10 chooses
to retransmit your signals, that is RS-10's control operator's problem, not
yours.

: This is a french point of view ! And that maybe explains why nobody deals with
: this problem in books.. So i made my QSO on RS10.. And heard some other
: no-code hams !

The reason it's not specifically addressed in books is because if you grasp
the concept of control op it's obviously OK. (Not trying to be mean, but
you've been lied to!!!)

Good luck, see you on the birds!!!
--
David Tiller | Network Administrator | Voice: (804) 752-3710 |
dtiller@rmc.edu | n2kau/4 | Randolph-Macon College| Fax: (804) 752-7231 |
"Drunk, [Beowulf] slew no | P.O. Box 5005 | ICBM: 37d 42' 43.75" N |
hearth companions." | Ashland, Va 23005 | 77d 31' 32.19" W |

1562. AEA DSP-1232 problem

Newsgroup: rec.radio.amateur.space
Date: 1994-09-29 22:31:22 UTC
From: rparsons@tcet.unt.edu
Message-ID: <36ff7q$a8@hermes.unt.edu>
Source record: 26665

The manual is backwards on the up/down connector. Pins 1 and 4 are for Radio 2 while pins 3 and 5 are for Radio 1.

Hope this helps

Ron W5RKN

1563. Re: Shuttle Audio Re-broadcasting

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 00:04:34 UTC
From: hrsblackwell@hrs.gsfc.nasa.gov
Message-ID: <hrsblackwell-2909942004340001@n3kwu.gsfc.nasa.gov>
Source record: 26667

In article <ve9bm.27.000880D5@nbnet.nb.ca>, ve9bm@nbnet.nb.ca (Brent Moore) wrote:

> Hi
> I am posting this message on behalf of a non internet ham who would love
> to obtain permission from NASA to re-broadcast mission audio via VHF on a
> local repeater.
> Can anybody please give me a name(s) of people he could contact to obtain
> permission to do this.
> Thanks
>
> 73 de Brent VE9BM

I assume you mean re-transmitting NASA Television Audio ? If so, then you should
contact NASA TV (in Washington DC at NASA HQ). This is the best way as NASA TV wants to know about anyone utilizing their broadcasts (they are very interested as to who
and how many their audience is). I do not have their number offhand, but can find it
if you'd like it. I would encourage anyone who watches NASA TV to let them know
how much you appreciate them.

However, I caution that NASA TV audio may transmit things that are not permitted under
your FCC Amateur license. The Goddard Amateur Radio Club, Inc. retransmits NASCOM
audio which excludes such things as press conferences, which is the most likely (although unlikely)
to produce illegal transmissions. BTW, we are on HF at 3.860, 7.185, 14.295, 21.395 and on
occasion 28.650 MHz. Locally to the Washington DC area, we retransmit on 147.45 MHz
FM simplex.

We are presently testing our new dedicated facility as well as upgrading and rehabing our
antenna farm and would like signal reports.

1564. Re: Mac sat antenna-positioning program ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 01:58:41 UTC
From: winter@apple.com
Message-ID: <36frch$9t4@apple.com>
Source record: 26670

In article <9409280448.AA22606@tomcat1.tbe.com>,
David Kelly <kelly@tomcat1.tbe.COM> wrote:
>
>I've tried sat-trak-102 and OrbiTrack. Couldn't master the Keps for SatTrack
>without reading the documentation, but had no trouble with OrbiTrack. I don't
>think either will automatically drive your rotators.

SatTrak can directly read NASA 2-line element sets. Then you just need
to tell it to convert them to the longer format (one click of the mouse)
and save the new elset. Easy to do. SatTrak and MacSPOC are the two
programs I use all the time (SatTrak for predictive tables, MacSPOC
for real-time shuttle tracking).

Patty

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

1565. ORBS$273.1OF2.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 04:16:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-273.o.1994@ampr.org>
Source record: 26681
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-273.O
Orbital Elements 273.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX September 30, 1994
BID: $ORBS-273.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94271.03742138
Element set: 310
Inclination: 26.8572 deg
RA of node: 305.7899 deg
Eccentricity: 0.6028491
Arg of perigee: 214.5625 deg
Mean anomaly: 84.8801 deg
Mean motion: 2.05882968 rev/day
Decay rate: -3.51e-06 rev/day^2
Epoch rev: 8490
Checksum: 317

Satellite: UO-11
Catalog number: 14781
Epoch time: 94268.00144558
Element set: 733
Inclination: 97.7853 deg
RA of node: 278.0514 deg
Eccentricity: 0.0011286
Arg of perigee: 316.0016 deg
Mean anomaly: 44.0298 deg
Mean motion: 14.69247006 rev/day
Decay rate: 6.3e-07 rev/day^2
Epoch rev: 56496
Checksum: 309

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94268.02843046
Element set: 960
Inclination: 82.9213 deg
RA of node: 255.0378 deg
Eccentricity: 0.0013217
Arg of perigee: 103.9971 deg
```

Mean anomaly: 256.2651 deg
Mean motion: 13.72341657 rev/day
Decay rate: 2.4e-07 rev/day^2
Epoch rev: 36360
Checksum: 295

Satellite: AO-13
Catalog number: 19216
Epoch time: 94268.85908553
Element set: 967
Inclination: 57.7254 deg
RA of node: 229.1074 deg
Eccentricity: 0.7234287
Arg of perigee: 351.1080 deg
Mean anomaly: 0.8163 deg
Mean motion: 2.09723820 rev/day
Decay rate: -2.52e-06 rev/day^2
Epoch rev: 4812
Checksum: 309

Satellite: FO-20
Catalog number: 20480
Epoch time: 94267.85666911
Element set: 728
Inclination: 99.0534 deg
RA of node: 40.9163 deg
Eccentricity: 0.0541308
Arg of perigee: 113.7310 deg
Mean anomaly: 252.1529 deg
Mean motion: 12.83227496 rev/day
Decay rate: -4.3e-07 rev/day^2
Epoch rev: 21691
Checksum: 301

Satellite: AO-21
Catalog number: 21087
Epoch time: 94270.45240692
Element set: 516
Inclination: 82.9370 deg
RA of node: 67.0209 deg
Eccentricity: 0.0035263
Arg of perigee: 157.2387 deg
Mean anomaly: 203.0290 deg
Mean motion: 13.74545468 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 18363
Checksum: 300

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94271.56766864

Element set: 733
Inclination: 82.9192 deg
RA of node: 294.7832 deg
Eccentricity: 0.0028994
Arg of perigee: 177.7183 deg
Mean anomaly: 182.4109 deg
Mean motion: 13.74047129 rev/day
Decay rate: 4.9e-07 rev/day^2
Epoch rev: 18284
Checksum: 353

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94262.03583661
Element set: 280
Inclination: 2.0483 deg
RA of node: 94.8577 deg
Eccentricity: 0.2912797
Arg of perigee: 191.9219 deg
Mean anomaly: 161.1305 deg
Mean motion: 1.42202795 rev/day
Decay rate: -1.23e-06 rev/day^2
Epoch rev: 253
Checksum: 285

/EX
SB KEPS @ AMSAT $ORBS-273.D
Orbital Elements 273.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX September 30, 1994
BID: $ORBS-273.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94267.73275563
Element set: 33
Inclination: 98.5870 deg
RA of node: 351.1405 deg
Eccentricity: 0.0010299
Arg of perigee: 260.0414 deg
Mean anomaly: 99.9603 deg
Mean motion: 14.29855473 rev/day
Decay rate: -2.5e-07 rev/day^2
Epoch rev: 24381
Checksum: 308

Satellite: AO-16
Catalog number: 20439
Epoch time: 94267.78457414
Element set: 831

Inclination: 98.5958 deg
RA of node: 352.5326 deg
Eccentricity: 0.0010595
Arg of perigee: 261.0681 deg
Mean anomaly: 98.9301 deg
Mean motion: 14.29909495 rev/day
Decay rate: -9.0e-08 rev/day^2
Epoch rev: 24383
Checksum: 343

Satellite: DO-17
Catalog number: 20440
Epoch time: 94267.72918637
Element set: 832
Inclination: 98.5966 deg
RA of node: 352.8356 deg
Eccentricity: 0.0010733
Arg of perigee: 260.0751 deg
Mean anomaly: 99.9213 deg
Mean motion: 14.30049404 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 24384
Checksum: 316

Satellite: WO-18
Catalog number: 20441
Epoch time: 94271.76451361
Element set: 835
Inclination: 98.5960 deg
RA of node: 356.8130 deg
Eccentricity: 0.0011169
Arg of perigee: 247.9646 deg
Mean anomaly: 112.0349 deg
Mean motion: 14.30023688 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 24442
Checksum: 299

Satellite: LO-19
Catalog number: 20442
Epoch time: 94270.19646934
Element set: 830
Inclination: 98.5970 deg
RA of node: 355.5485 deg
Eccentricity: 0.0011476
Arg of perigee: 252.3414 deg
Mean anomaly: 107.6519 deg
Mean motion: 14.30121238 rev/day
Decay rate: 2.1e-07 rev/day^2
Epoch rev: 24421
Checksum: 291

Satellite: UO-22
Catalog number: 21575
Epoch time: 94271.75002581
Element set: 537
Inclination: 98.4270 deg
RA of node: 344.1110 deg
Eccentricity: 0.0007774
Arg of perigee: 348.3894 deg
Mean anomaly: 11.7113 deg
Mean motion: 14.36932512 rev/day
Decay rate: -8.0e-08 rev/day^2
Epoch rev: 16795
Checksum: 297

Satellite: KO-23
Catalog number: 22077
Epoch time: 94271.88179524
Element set: 430
Inclination: 66.0802 deg
RA of node: 62.8714 deg
Eccentricity: 0.0015417
Arg of perigee: 262.7001 deg
Mean anomaly: 97.2266 deg
Mean motion: 12.86287673 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 10012
Checksum: 291

Satellite: AO-27
Catalog number: 22825
Epoch time: 94267.75824516
Element set: 329
Inclination: 98.6459 deg
RA of node: 342.5288 deg
Eccentricity: 0.0008049
Arg of perigee: 282.3616 deg
Mean anomaly: 77.6664 deg
Mean motion: 14.27634788 rev/day
Decay rate: -7.0e-08 rev/day^2
Epoch rev: 5189
Checksum: 359

Satellite: IO-26
Catalog number: 22826
Epoch time: 94270.18478472
Element set: 327
Inclination: 98.6423 deg
RA of node: 344.9794 deg
Eccentricity: 0.0008520
Arg of perigee: 275.0739 deg
Mean anomaly: 84.9475 deg
Mean motion: 14.27740073 rev/day

Decay rate: 2.0e-08 rev/day^2
Epoch rev: 5224
Checksum: 322

Satellite: KO-25
Catalog number: 22830
Epoch time: 94270.17228034
Element set: 334
Inclination: 98.5467 deg
RA of node: 341.1307 deg
Eccentricity: 0.0010700
Arg of perigee: 237.2473 deg
Mean anomaly: 122.7684 deg
Mean motion: 14.28064200 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 5225
Checksum: 261

Satellite: 22828
Catalog number: 22828
Epoch time: 94270.24174961
Element set: 306
Inclination: 98.6418 deg
RA of node: 345.0583 deg
Eccentricity: 0.0009417
Arg of perigee: 258.9002 deg
Mean anomaly: 101.1119 deg
Mean motion: 14.28066941 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 2034
Checksum: 300

/EX

1566. ORBS$276.2OF2.AMSAT

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 04:18:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-273.w.1994@ampr.org>
Source record: 26680
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-273.W
Orbital Elements 273.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX September 30, 1994
BID: $ORBS-273.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94271.79179281
Element set: 970
Inclination: 99.0384 deg
RA of node: 323.4350 deg
Eccentricity: 0.0014404
Arg of perigee: 289.7741 deg
Mean anomaly: 70.1868 deg
Mean motion: 14.13645402 rev/day
Decay rate: 4.6e-07 rev/day^2
Epoch rev: 50489
Checksum: 322

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94271.87287141
Element set: 870
Inclination: 98.5083 deg
RA of node: 277.7167 deg
Eccentricity: 0.0014108
Arg of perigee: 29.6093 deg
Mean anomaly: 330.5882 deg
Mean motion: 14.24906282 rev/day
Decay rate: -.00000000 rev/day^2
Epoch rev: 41726
Checksum: 312

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94271.20567382
Element set: 410
Inclination: 82.5436 deg
RA of node: 186.6382 deg
Eccentricity: 0.0015145
Arg of perigee: 254.0416 deg
```

Mean anomaly: 105.9077 deg
Mean motion: 13.84721705 rev/day
Decay rate: 4.5e-07 rev/day^2
Epoch rev: 33661
Checksum: 296

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94267.91426415
Element set: 328
Inclination: 82.5351 deg
RA of node: 253.1054 deg
Eccentricity: 0.0017739
Arg of perigee: 17.5351 deg
Mean anomaly: 342.6386 deg
Mean motion: 13.16968747 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29638
Checksum: 322

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94271.87847883
Element set: 788
Inclination: 99.1817 deg
RA of node: 263.3774 deg
Eccentricity: 0.0011327
Arg of perigee: 198.8816 deg
Mean anomaly: 161.1937 deg
Mean motion: 14.13017585 rev/day
Decay rate: 1.6e-07 rev/day^2
Epoch rev: 30978
Checksum: 350

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94271.86552775
Element set: 329
Inclination: 82.5162 deg
RA of node: 61.2547 deg
Eccentricity: 0.0013971
Arg of perigee: 302.5227 deg
Mean anomaly: 57.4585 deg
Mean motion: 13.84372473 rev/day
Decay rate: 3.0e-07 rev/day^2
Epoch rev: 28203
Checksum: 313

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94270.32270566

Element set: 154
Inclination: 82.5530 deg
RA of node: 199.3561 deg
Eccentricity: 0.0008246
Arg of perigee: 50.2543 deg
Mean anomaly: 309.9296 deg
Mean motion: 13.04405120 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23621
Checksum: 266

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94267.69635271
Element set: 831
Inclination: 82.5462 deg
RA of node: 129.4460 deg
Eccentricity: 0.0014456
Arg of perigee: 227.5144 deg
Mean anomaly: 132.4786 deg
Mean motion: 13.84180745 rev/day
Decay rate: -3.1e-07 rev/day^2
Epoch rev: 21438
Checksum: 310

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94272.07393375
Element set: 119
Inclination: 98.8251 deg
RA of node: 288.8720 deg
Eccentricity: 0.0016829
Arg of perigee: 85.9279 deg
Mean anomaly: 274.4232 deg
Mean motion: 14.01328042 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 20825
Checksum: 321

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94268.39573962
Element set: 840
Inclination: 82.5209 deg
RA of node: 66.2456 deg
Eccentricity: 0.0014045
Arg of perigee: 122.2702 deg
Mean anomaly: 237.9821 deg
Mean motion: 13.83589540 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 20161

Checksum: 298

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94267.95954681
Element set: 738
Inclination: 82.5384 deg
RA of node: 99.0681 deg
Eccentricity: 0.0012485
Arg of perigee: 301.6610 deg
Mean anomaly: 58.3305 deg
Mean motion: 13.16464435 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16448
Checksum: 310

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94271.80747351
Element set: 197
Inclination: 98.6090 deg
RA of node: 297.2691 deg
Eccentricity: 0.0012314
Arg of perigee: 299.8832 deg
Mean anomaly: 60.1128 deg
Mean motion: 14.22450549 rev/day
Decay rate: 7.9e-07 rev/day^2
Epoch rev: 17523
Checksum: 311

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94271.84562345
Element set: 744
Inclination: 82.5536 deg
RA of node: 43.5279 deg
Eccentricity: 0.0012447
Arg of perigee: 302.5971 deg
Mean anomaly: 57.3939 deg
Mean motion: 13.16834041 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15010
Checksum: 297

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94268.13360374
Element set: 339
Inclination: 82.5469 deg
RA of node: 127.2493 deg
Eccentricity: 0.0022172

Arg of perigee: 309.8933 deg
Mean anomaly: 50.0277 deg
Mean motion: 13.83015397 rev/day
Decay rate: 5.8e-07 rev/day^2
Epoch rev: 5390
Checksum: 310

/EX
SB KEPS @ AMSAT $ORBS-273.M
Orbital Elements 273.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX September 30, 1994
BID: $ORBS-273.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94267.72677565
Element set: 321
Inclination: 98.6432 deg
RA of node: 342.5879 deg
Eccentricity: 0.0009344
Arg of perigee: 267.5753 deg
Mean anomaly: 92.4353 deg
Mean motion: 14.28041074 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 5190
Checksum: 315

Satellite: MIR
Catalog number: 16609
Epoch time: 94271.22973578
Element set: 773
Inclination: 51.6483 deg
RA of node: 30.7759 deg
Eccentricity: 0.0002346
Arg of perigee: 71.0697 deg
Mean anomaly: 289.0604 deg
Mean motion: 15.57150756 rev/day
Decay rate: 4.416e-05 rev/day^2
Epoch rev: 49207
Checksum: 324

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94269.92257599
Element set: 539
Inclination: 28.4706 deg
RA of node: 302.4460 deg
Eccentricity: 0.0006518
Arg of perigee: 72.4139 deg

Mean anomaly: 287.7153 deg
Mean motion: 14.90678026 rev/day
Decay rate: 3.39e-06 rev/day^2
Epoch rev: 4458
Checksum: 323

Satellite: GRO
Catalog number: 21225
Epoch time: 94270.59000999
Element set: 144
Inclination: 28.4622 deg
RA of node: 241.0410 deg
Eccentricity: 0.0003021
Arg of perigee: 288.8106 deg
Mean anomaly: 71.2173 deg
Mean motion: 15.41298504 rev/day
Decay rate: 1.939e-05 rev/day^2
Epoch rev: 7275
Checksum: 270

Satellite: UARS
Catalog number: 21701
Epoch time: 94270.85186363
Element set: 600
Inclination: 56.9851 deg
RA of node: 107.6492 deg
Eccentricity: 0.0004424
Arg of perigee: 96.9163 deg
Mean anomaly: 263.2373 deg
Mean motion: 14.96485853 rev/day
Decay rate: 1.457e-05 rev/day^2
Epoch rev: 16630
Checksum: 310

/EX

1567. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 08:50:33 UTC
From: caralt@gaig.upc.es
Message-ID: <36gjgpINNokg@diable.upc.es>
Source record: 26669

[No readable article body recovered]

1568. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 08:54:03 UTC
From: caralt@gaig.upc.es
Message-ID: <36gjnbINNovi@diable.upc.es>
Source record: 26668

[No readable article body recovered]

1569. RE: Mac sat antenna-positioning program ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 12:02:18 UTC
From: pchien@ids.net
Message-ID: <36huil$8lu@paperboy.ids.net>
Source record: 26672

Check out Orbittrak. It's an excellent program which lets you
track dozen's of satellites at the same time (although the
screen does get to be a bit confusing when you do that) and
can be hooked up to a rotor through a controller (I forget
what model) hooked up to your serial port.

Oh yeah, it's shareware and at $20 an excellent buy.

Philip Chien
no sig yet

In Article <1994Sep26.021711.1@violet.ccit.arizona.edu>
dpalik@violet.ccit.arizona.edu writes:
>Is there a Macintosh satellite computer-tracking and
>antenna-control/positioning program out there anywhere ?
>
>Thanks,
>
>Don Palik
>dpalik@ccit.arizona.edu

1570. STS-68 Successful Launch

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 12:47:04 UTC
From: astroman@netcom.com
Message-ID: <astromanCwy0uG.C23@netcom.com>
Source record: 26675
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

STS-68 had a nominal launch with liftoff on 30-Sep-94 / 11:16:00.094 UTC.

The catalog information is as follows:

SATNO: 23285
Int Des 1994-062A (94062 A)

SM

1571. SETI Downloads...

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 14:15:33 UTC
From: MichaelMK@infoport.com
Message-ID: <7.47729205.InfoPort@infoport.com>
Source record: 26676

The message thread on my BBS system only goes back about five days; I'm wondering if I missed any replies to my enquiry whether data from the SETI (Search for Extraterrestrial Intelligence) Project is available on-line. If so, I'd like to know.

Thanks,
MichaelMK **********
Message sent from InfoPort Online Service
Denver, Colorado USA (303) 429-0291 or telnet infoport.com
A full service bulletin board using NovaLink Professional Software
****

1572. Is there a microsat FAQ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 16:15:47 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <36hdjj$8c9@newsstand.cit.cornell.edu>
Source record: 26677

Having some satellite experience under my belt, as well as some packet etc, I've finally gotten curious about using the microsats. Primary drive for it is a friend who is heading out on a boat trip with his Tech license and thinking how nice it would be to be able to exchange packet mail with him while he's in Fiji or wherever via a store and forward bird.

Last time I looked at them, I thought that there were too many different modems and stuff, and DSP units like the AEA and LLGrace units were just coming out so I elected to wait and see.

So what's it take? I've got a 736 and an old PK232 (pre MBX) I think I need a special modem and some special software, right? My friend has a dual band FM rig, and if I have it right I think we could probably use it as is for uplink and need to break out to a separate detector (such as his HF rig) to decode the downlink.

Do we run 1200 baud? 9600 baud? Where do you get the software, etc. Are several of the satellites running the same stuff, or are they all different? Are they very crowded?

Help and counsel appreciated.

73 de Kevin, WB2EMS

1573. Two-Line Orbital Element Sets (TLE478)

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 18:56:19 UTC
From: tkelso@eel.afit.af.mil
Message-ID: <tkelso.780951369@afit.af.mil>
Source record: 26674

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #478 -
Alouette 1
1 00424U 62049 94267.82737412 .00000095 00000-0 10155-3 0 353
2 00424 80.4630 186.6901 0021943 217.9904 141.9681 13.67818728596028
ATS 1
1 02608U 66110A 94249.53724428 -.00000293 00000-0 10000-3 0 9060
2 02608 14.5927 359.6395 0009959 51.7405 82.5214 1.00347651 18288
ATS 3
1 03029U 67111A 94269.70704807 -.00000113 00000-0 10000-3 0 2592
2 03029 14.7155 6.4257 0009123 263.2441 244.9294 1.00272920 98453
Cosmos 398
1 04966U 71016A 94273.12842618 .00116531 70551-5 21285-3 0 5400
2 04966 51.4434 270.5740 0934827 320.9601 32.7293 14.09793864787444
Starlette
1 07646U 75010A 94267.99880038 -.00000123 00000-0 14683-4 0 8227
2 07646 49.8284 119.4810 0205860 305.8477 52.3446 13.82187237991655
LAGEOS
1 08820U 76039A 94270.67279268 -.00000009 00000-0 10000-3 0 414
2 08820 109.8048 170.6874 0043806 263.2229 96.3522 6.38665167173691
ETS-2
1 09852U 77014A 94269.72393698 -.00000083 00000-0 10000-3 0 9929
2 09852 12.3399 40.3062 0003612 75.8048 47.6601 0.99997532 11348
GOES 2
1 10061U 77048A 94272.36945361 .00000076 00000-0 00000+0 0 4217
2 10061 11.3868 44.4603 0003302 48.9995 271.7286 1.00268279 8152
IUE
1 10637U 78012A 94261.16369563 -.00000247 00000-0 10000-3 0 478
2 10637 34.7563 93.4020 1318601 38.7328 228.0418 1.00238449 13657
GPS BI-01
1 10684U 78020A 94266.68618703 -.00000031 00000-0 10000-3 0 3041
2 10684 64.6986 42.5970 0063043 163.2254 197.0212 1.98069617106888
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GPS BI-02
1 10893U 78047A 94269.92604176 .00000029 00000-0 10000-3 0 1078
2 10893 63.4162 281.1622 0215928 13.9859 346.6085 2.01626442120124
GOES 3
1 10953U 78062A 94271.49599825 .00000048 00000-0 10000-3 0 3827
2 10953 10.3279 47.2282 0005827 75.5555 244.3855 1.00273950 12754
SeaSat 1
1 10967U 78064A 94267.87705589 -.00000064 00000-0 23628-4 0 3322
2 10967 108.0025 308.5289 0001671 234.9550 125.1435 14.37978742850690
GPS BI-03
1 11054U 78093A 94264.36839484 -.00000008 00000-0 10000-3 0 2242
2 11054 63.1793 278.9033 0044355 179.1901 180.8706 1.93505598116376
Nimbus 7
1 11080U 78098A 94268.16821191 -.00000109 00000-0 -60345-4 0 4348
2 11080 99.0403 147.9877 0008431 222.1068 137.9434 13.83723334803905
GPS BI-04
1 11141U 78112A 94272.56331876 -.00000003 00000-0 00000+0 0 9274
2 11141 64.7050 43.8320 0048307 26.5525 333.6982 1.92894923 5791
GPS BI-05
1 11690U 80011A 94270.62583752 -.00000002 00000-0 10000-3 0 8397
2 11690 65.0604 44.2107 0142187 196.1360 163.4389 2.00558184121592
GPS BI-06
1 11783U 80032A 94268.26267165 .00000020 00000-0 10000-3 0 141
2 11783 62.6364 274.8703 0211494 28.9393 332.2166 2.03456590105996
GOES 5
1 12472U 81049A 94269.92415235 -.00000088 00000-0 10000-3 0 7998
2 12472 7.0376 56.9151 0006439 25.7136 147.0315 1.00340033 6780
Cosmos 1383
1 13301U 82066A 94271.88593362 .00000024 00000-0 10919-4 0 3340
2 13301 82.9271 233.7099 0027187 165.6098 194.5831 13.68058197611605
LandSat 4
1 13367U 82072A 94269.76055068 .00000017 00000-0 13704-4 0 5382
2 13367 98.1706 326.4135 0006534 307.0646 52.9951 14.57130526648857
IRAS
1 13777U 83004A 94271.53049465 .00000310 00000-0 24343-3 0 7282
2 13777 98.9700 100.3303 0013556 34.3438 325.8603 13.99212393265591
Cosmos 1447
1 13916U 83021A 94271.57756641 .00000017 00000-0 15646-5 0 4358
2 13916 82.9448 295.2322 0039100 99.2375 261.3207 13.74313393577535
TDRS 1
1 13969U 83026B 94272.65540645 -.00000192 00000-0 10000-3 0 3458
2 13969 7.9295 49.6206 0052780 209.2861 69.8380 1.00279496 15096
GOES 6
1 14050U 83041A 94269.28396179 .00000053 00000-0 10000-3 0 2772
2 14050 5.8235 59.8739 0003538 5.6565 271.8951 1.00242251 13792
OSCAR 10
1 14129U 83058B 94272.49345949 -.00000206 00000-0 10000-3 0 3124
2 14129 26.8510 305.5389 6029381 214.9865 84.0238 2.05881116 56961
LandSat 5
1 14780U 84021A 94270.14079758 .00000005 00000-0 11156-4 0 1308
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2 14780 98.1540 327.8178 0004272 317.1250 42.9615 14.57142357562323
UoSat 2
1 14781U 84021B 94268.00144558 .00000063 00000-0 18490-4 0 7333
2 14781 97.7853 278.0514 0011286 316.0016 44.0298 14.69247006564960
GPS BI-09
1 15039U 84059A 94271.59283116 -.00000016 00000-0 10000-3 0 2346
2 15039 64.3773 38.2846 0081575 16.6648 343.6059 1.92302207 75321
Cosmos 1574
1 15055U 84062A 94271.72569892 .00000038 00000-0 24440-4 0 6364
2 15055 82.9592 348.6920 0026337 290.7204 69.1129 13.73610697514843
GPS BI-10
1 15271U 84097A 94270.34659646 .00000037 00000-0 10000-3 0 8633
2 15271 62.3194 274.9320 0149473 349.4247 10.2901 2.00586608 72659
Cosmos 1602
1 15331U 84105A 94271.91197780 .00000288 00000-0 31263-4 0 3256
2 15331 82.5352 340.5993 0018696 218.0918 141.8990 14.84462289539908
NOAA 9
1 15427U 84123A 94272.78269043 -.00000003 00000-0 22446-4 0 9727
2 15427 99.0385 324.4365 0014436 286.7580 73.2011 14.13645036505036
GPS BI-11
1 16129U 85093A 94210.68349276 -.00000037 00000-0 10000-3 0 6188
2 16129 64.9965 42.6389 0150311 89.3128 272.4428 1.89368102 8885
Mir
1 16609U 86017A 94272.51327074 .00004957 00000-0 73611-4 0 7756
2 16609 51.6480 24.3484 0002492 74.2596 285.8670 15.57167077492279
SPOT 1
1 16613U 86019A 94273.18605783 .00000089 00000-0 62356-4 0 7311
2 16613 98.6737 344.9257 0001600 40.7398 319.3898 14.20060782131467
Cosmos 1766
1 16881U 86055A 94267.98696103 .00000160 00000-0 16529-4 0 2401
2 16881 82.5170 42.2292 0017588 259.7594 100.1640 14.83487883440251
EGP
1 16908U 86061A 94267.82750767 -.00000097 00000-0 00000+0 0 9328
2 16908 50.0138 138.0645 0011348 206.2638 153.7623 12.44410748 37792
NOAA 10
1 16969U 86073A 94272.85595066 -.00000005 00000-0 15951-4 0 8724
2 16969 98.5084 278.6698 0014102 26.9893 333.2017 14.24906314417407
MOS-1
1 17527U 87018A 94271.12969741 .00000001 00000-0 32730-4 0 1271
2 17527 99.0232 337.6074 0001085 17.4884 342.6323 13.94905254387299
GOES 7
1 17561U 87022A 94272.23843419 -.00000053 00000-0 10000-3 0 384
2 17561 1.7748 74.6551 0003485 6.7291 259.9166 1.00276864 11017
Kvant-1
1 17845U 87030A 94271.74314952 .00009002 00000-0 12815-3 0 16
2 17845 51.6468 28.2074 0002421 78.4340 281.6867 15.57161665492247
DMSP B5D2-3
1 18123U 87053A 94272.77752416 .00000004 00000-0 24366-4 0 6650
2 18123 98.7861 102.9257 0013217 242.3361 117.6472 14.15373058375883
RS-10/11
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1 18129U 87054A 94268.02843046 .00000024 00000-0 97667-5 0 9605
2 18129 82.9213 255.0378 0013217 103.9971 256.2651 13.72341657363606
Meteor 2-16
1 18312U 87068A 94268.13960741 .00000059 00000-0 39331-4 0 3311
2 18312 82.5546 132.6008 0011508 186.8436 173.2569 13.84038707358884
Meteor 2-17
1 18820U 88005A 94272.79533692 .00000052 00000-0 32933-4 0 4129
2 18820 82.5438 185.3744 0015097 248.9920 110.9617 13.84721894336834
DMSP B5D2-4
1 18822U 88006A 94271.56152400 .00000025 00000-0 29584-4 0 7660
2 18822 98.4309 122.1973 0006956 42.5595 317.6127 14.23119466345306
Glonass 34
1 19163U 88043A 94267.43377799 .00000030 00000-0 10000-3 0 9313
2 19163 65.0594 107.1092 0008176 148.3684 211.7491 2.13102447 48772
Glonass 36
1 19165U 88043C 94271.71301373 .00000072 00000-0 10000-3 0 3248
2 19165 65.0391 106.9418 0004824 2.8993 357.1475 2.13102241 49489
METEOSAT 3
1 19215U 88051A 94273.21468344 -.00000262 00000-0 10000-3 0 27
2 19215 1.9582 71.6543 0000739 157.9472 142.1654 1.00270891 10962
AO-13
1 19216U 88051B 94268.85908553 -.00000252 00000-0 10000-4 0 9673
2 19216 57.7254 229.1074 7234287 351.1080 0.8163 2.09723820 16623
OKEAN 1
1 19274U 88056A 94267.71242927 .00000183 00000-0 19823-4 0 9407
2 19274 82.5146 142.5598 0021729 44.3500 315.9439 14.82217866335822
Meteor 3-2
1 19336U 88064A 94267.91426415 .00000051 00000-0 10000-3 0 3284
2 19336 82.5351 253.1054 0017739 17.5351 342.6386 13.16968747296389
Glonass 39
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2 19876 0.6584 65.2634 0001311 76.6760 283.4431 1.00274375 330
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2 20103 82.9604 210.5930 0038231 0.6978 359.4224 13.73842796262676
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2 20185 54.9466 136.2459 0008930 278.3571 81.6459 2.00563370 37420
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KO-25
1 22830U 93061H 94270.17228034 .00000013 00000-0 22445-4 0 3341
2 22830 98.5467 341.1307 0010700 237.2473 122.7684 14.28064200 52252
GPS BIIA-23
1 22877U 93068A 94268.47468550 .00000001 00000-0 00000+0 0 1723
2 22877 55.2707 74.4176 0032429 287.7948 71.8755 2.00567811 6748
METEOSAT 6
1 22912U 93073B 94272.47551505 -.00000088 00000-0 00000+0 0 1431
2 22912 0.7192 265.3293 0003002 249.2337 15.2958 1.00271209 1577
HST Array
1 22920U 90037C 94272.78112775 .00003996 00000-0 32003-3 0 2111
2 22920 28.4682 267.7027 0002992 284.8551 75.1728 14.97664680 45182
Meteor 3-6
1 22969U 94003A 94268.61526980 .00000051 00000-0 10000-3 0 1037
```

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2 22969 82.5634 345.4010 0016135 18.1892 341.9804 13.16724651 32066
TUBSAT-B
1 22970U 94003B 94271.71189963 .00000051 00000-0 10000-3 0 949
2 22970 82.5641 343.1875 0016550 9.5573 350.5861 13.16822458 32479
ODERACS A
1 22990U 94006B 94273.06212740 .01312209 11265-4 32780-3 0 2395
2 22990 56.9702 195.0454 0002552 26.5192 333.6197 16.28466652 36962
ODERACS B
1 22991U 94006C 94273.21175351 .01011145 11165-4 35788-3 0 2215
2 22991 56.9734 195.2879 0004211 43.3951 316.7497 16.24488243 36977
ODERACS E
1 22994U 94006F 94269.29318383 .00027260 00000-0 10876-3 0 1323
2 22994 56.9777 228.1519 0016010 35.9001 324.3176 15.86307363 36134
ODERACS F
1 22995U 94006G 94270.85406650 .00046971 00000-0 18044-3 0 1733
2 22995 56.9810 220.8334 0015926 41.1603 319.0645 15.86807799 36386
BREMSAT
1 22998U 94006H 94271.91697919 .00050407 00000-0 19595-3 0 1623
2 22998 56.9851 217.2906 0013783 56.6949 303.5537 15.86587351 20382
GPS BIIA-24
1 23027U 94016A 94271.04986092 -.00000069 00000-0 00000+0 0 1048
2 23027 54.9864 15.3402 0064788 193.1694 166.6866 2.00565438 4100
Glonass 62
1 23043U 94021A 94270.26805556 -.00000061 00000-0 00000+0 0 1020
2 23043 64.8065 345.8209 0007324 191.7197 168.4233 2.13103345 3603
Glonass 63
1 23044U 94021B 94270.62002936 -.00000060 00000-0 00000+0 0 873
2 23044 64.7961 345.8066 0030634 204.2019 155.7108 2.13103811 3611
Glonass 64
1 23045U 94021C 94268.91862646 -.00000064 00000-0 00000+0 0 1038
2 23045 64.7836 345.8834 0009148 36.2897 323.8298 2.13103072 3571
GOES 8
1 23051U 94022A 94271.46553657 -.00000188 00000-0 00000+0 0 1889
2 23051 0.2314 266.4089 0003737 309.3601 228.3952 1.00264785 1331
MSTI 2
1 23101U 94028A 94271.21872742 .00004281 00000-0 85655-4 0 861
2 23101 97.1117 103.5762 0013845 120.2330 240.0318 15.47207344 21975
STRV-1A
1 23125U 94034B 94269.94285726 .00001923 00000-0 42116-3 0 438
2 23125 6.9130 142.7657 7291629 261.4579 18.0061 2.27444737 2082
STRV-1B
1 23126U 94034C 94270.12400763 .00001590 00000-0 27801-3 0 468
2 23126 6.9177 142.8827 7299040 261.3798 17.6592 2.27028529 1980
Soyuz TM-19
1 23139U 94036A 94271.74314952 .00009002 00000-0 12815-3 0 1014
2 23139 51.6468 28.2074 0002421 78.4340 281.6867 15.57161665 13924
Nadezhda 4
1 23179U 94041A 94271.71979483 .00000043 00000-0 28428-4 0 313
2 23179 82.9493 341.6457 0038058 75.9201 284.6180 13.75657866 10528
Glonass 65
```

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1 23203U 94050A 94271.40251644 .00000028 00000-0 00000+0 0 458
2 23203 64.8324 225.2278 0006717 157.4465 202.5775 2.13101989 1025
Glonass 66
1 23204U 94050B 94271.16759947 .00000029 00000-0 00000+0 0 553
2 23204 64.8197 225.2673 0015416 340.8430 19.0928 2.13102268 1010
Glonass 67
1 23205U 94050C 94269.17339250 .00000035 00000-0 10000-4 0 477
2 23205 64.8311 225.3214 0003016 292.6386 67.3211 2.13102137 978
ProgressM24
1 23215U 94052A 94271.74314952 .00009002 00000-0 12815-3 0 678
2 23215 51.6468 28.2074 0002421 78.4340 281.6867 15.57161665 5324
DMSP B5D2-7
1 23233U 94057A 94272.73477744 .00000114 00000-0 85732-4 0 418
2 23233 98.9164 327.6964 0012708 151.4253 208.7613 14.12537493 4390
1994057B
1 23234U 94057B 94269.76299292 .00000543 00000-0 31870-3 0 136
2 23234 98.9124 324.7262 0009227 134.1706 226.0216 14.12387170 3979
1994057C
1 23235U 94057C 94268.13254089 .00000663 00000-0 38327-3 0 151
2 23235 98.9156 323.1043 0008808 134.8830 225.3067 14.12447132 3740
1994056C
1 23248U 94056C 94254.87048067 -.00000109 00000-0 10000-3 0 38
2 23248 13.0650 97.1544 5212348 196.3471 137.0381 1.70202954 94
TELSTAR 402
1 23249U 94058A 94266.62404173 .00012699 00000-0 11164-2 0 106
2 23249 6.6552 163.1911 7295380 191.8599 131.9387 2.28845777 343
Cosmos 2291
1 23267U 94060A 94272.37467653 -.00000102 00000-0 10000-3 0 106
2 23267 1.3169 278.8065 0003688 39.5860 264.5780 1.00056872 72
1994060B
1 23268U 94060B 94268.09578600 .21691735 12784-4 16669-3 0 222
2 23268 51.6073 259.2490 0005202 298.6077 61.5231 16.52282919 557
1994060C
1 23269U 94060 C 94265.41103389 .13621660 00000-0 11070-2 0 61
2 23269 051.6074 274.3730 0002099 221.8841 138.2708 16.39060068000119
1994060D
1 23270U 94060D 94266.52259266 -.00000186 00000-0 10000-4 0 23
2 23270 1.4991 279.6655 0014064 359.0718 0.5948 1.00041851 15
1994060E
1 23271U 94060E 94266.14333005 -.00000057 00000-0 10000-4 0 12
2 23271 47.5358 277.4858 7256873 0.5495 16.4079 2.26396358 57
1994060F
1 23272U 94060F 94270.53106764 .00000029 00000-0 10000-4 0 31
2 23272 47.5287 276.1014 7310817 1.1370 359.7887 2.26756272 164
Cosmos 2292
1 23278U 94061A 94272.91886199 .00001189 00000-0 11839-3 0 138
2 23278 82.9898 242.7280 1028119 124.4465 245.8215 13.21994968 314
1994061B
1 23279U 94061B 94272.23537050 .00000154 00000-0 10000-4 0 134
2 23279 82.9903 243.2004 1028723 125.5663 244.8017 13.23831565 229
```

1994061C
1 23281U 94061C 94272.23329361 .00008549 00000-0 59082-3 0 49
2 23281 82.9986 243.1749 1053639 126.3571 243.9632 13.26689621 229
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Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1574. * SpaceNews 03-Oct-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 19:00:24 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc1003.1994@ampr.org>
Source record: 26673
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC1003
* SpaceNews 03-Oct-94 *

BID: $SPC1003

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SpaceNews
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MONDAY OCTOBER 3, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited free distribution.

* SPACE CALENDAR *
==================
Oct ?? - Solidaridad Ariane Launch
Oct 03 - Soyuz TM-20 Launch (Russian)
Oct 04 - 35th Anniversary (1959), Luna 3 L (Russian Moon Flyby)
Oct 11 - Magellan Lowered into Atmosphere of Venus
Oct 12 - 30th Anniversary (1964), Voskhod 1 Launch (1st 3-Man
Space Flight)
Oct 12-14 - Magellan Crashes to Surface of Venus
Oct 18 - 5th Anniversary (1989), Galileo Launch
Oct 20-22 - Orionids Meteor Shower
Oct 27 - STS-66, Endeavour, Atmospheric Lab (ATLAS-3)
Oct 28 - Sakigake, 3rd Earth Flyby (Japan)
Oct 28 - 20th Anniversary (1974), Luna 23 Launch (Russian Moon Lander)
Oct 31 - Orion 1 Atlas 2A Launch

[Info via Ron Baalke at JPL]

* DP3MIR ACTIVE ABOARD MIR SOON *
==================================
German Astronaut Dr. Ulf Merbold will be QRV aboard the space station MIR
signing DP3MIR during the ESA EUROMIR 94 mission starting 03-OCT-1994. In
order to give actual information regarding the mission to as many radio
amateurs and SWLs as possible, he will use the digital voice memory of
MIR's ham radio equipment designed and built by Thomas Kieselbach, DL2MDE.
Thomas made an arrangement with Ulf Merbold, DP3MIR, to load actual spoken
reports into the digital memory frequently, as time permits however,
probably every 2-3 days. The reports in English and German will then be
retransmitted automatically during the consecutive orbits on 145.550 MHz
FM in regular time intervals. Ulf Merbold will stay aboard MIR for 30 days.

[Info via Norbert, DF5DP, DARC Coordinator Satellites an Space Projects]

* INTERNATIONAL SYMPOSIUM *
==========
The SpaceOps '94 International Symposium sponsored by the NASA/Goddard Space Flight Center (GSFC) will be held on November 15-18, 1994 at the Greenbelt Marriott Hotel in Greenbelt, Maryland.

The theme for the SpaceOps '94 is opportunities in ground data systems for high efficiency operations of space missions. Of special interest are techniques leading to improved system productivity, effectiveness, and efficiency; trade-offs between mission requirements and end-to-end system architectures; and new technologies and techniques for systems suited to future space missions.

The SpaceOps '94 will serve as a vehicle for communicating results and plans concerning present and future operations of space missions and ground systems. It generally attracts 400 specialists from many countries who take this opportunity to share their experience and knowledge with others engaged in similar activities.

For more information, please contact:
Laura Capella, Conference Coordinator
Jorge Scientific Corporation
Suite 1130
7500 Greenway Center Drive
Greenbelt, MD 20771
Voice: 301-220-1701 Fax: 301-220-1704
E-mail: spaceops@kong.gsfc.nasa.gov

A detailed version of this announcement is available via World Wide Web. The Mosaic access path is: http://ddwilson.gsfc.nasa.gov/SpaceOps.html.

[Info via Diem V. Nguyen]

* AO-21 NEWS *
==========
Satellite controllers recently noticed a significant event on AO-21. There have been 51 multi-bit errors in the RAMDISK where the actual WEFAX test image is stored. In addition, temporary bit errors in the EPROM that is used for testing purposes were found in the RAMDISK as well. At about the same time, operations at the host spacecraft resulted in a temperature increase of about 6 degrees C. Fortunately the program running in the RTX computer had been continuing to operate smoothly. Users could only notice that the FAX picture had been automatically replaced by telemetry in the schedule.

In order to find out what really happened, controllers are looking for copies of the AFSK Packet Telemetry of RUDAK II transmitted from 15-Sep-94 to 18-Sep-94. Copies should be sent:

- via PACKET to Robert: DD4YR @DB0AAB.#BAY.DEU.EU
- or via INTERNET to Peter : db2os@amsat.org

[Info via Gerhard DG2CV @ DB0AAB.#BAY.DEU.EU]

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews,
especially:

N2RPN KC4WP HG8LVS

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any
of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16, LUSAT-OSCAR-19

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1575. Is there a microsat FAQ?

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 19:03:15 UTC
From: rparsons@tcet.unt.edu
Message-ID: <36hndj$r6a@hermes.unt.edu>
Source record: 26671

You asked a lot of questions, but I'll try. As far as stroe-and-forward sats, in general there are the 1200 bps ones and 9600 bps ones. Other than having to make minor mods to your rig, the 9600 ones are easiest to use and much faster also. UO-22, KO-23 and KO-25 are the current ones. You will need a 9600 bps modem, TAPR has a kit, but you need a modem disconnect header, which the 232 doesn't have I believe. I think TAPR also as a header add-on kit also. TAPR/AMSAT also now has a DSP modem kit DSP-93. Contact AMSAT for software (you should be a member if you use the sats.

Ask more specific question and I'll try to answer.

Ron W5RKN

1576. Re: Packet Radio (SAREX)!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-09-30 19:21:21 UTC
From: pchien@ids.net
Message-ID: <36io9u$bas@paperboy.ids.net>
Source record: 26679

Blatant plug for myself follows -

The September/October issue of the Amsat Journal had a detailed article explaining why the STS-64 mission was power limited and SAREX would probably be restricted to voice only ops. Amsat members do get a bit more informations than the average ham. If you're interested in SAREX it doesn't hurt to follow the journals put out by the experiment's sponsors - especially when they're amateur radio organizations.

Modesty prevents me from telling you who wrote that article.

Also - all of the 'official' NASA information and SAREX bulletins stated that this mission would operate SAREX in the -B (voice only) mode of operations. The only way SAREX was approved for STS-64 was with the agreement that it wouldn't require any orbiter power (e.g. full operations on batteries - a/k/a voice only operations) -- even though the entire -C hardware (voice and packet) was carried on the chance that there would be enough power to operate packet later in the mission.

The late October (e.g. October 34 a/k/a/ November 3rd) STS-66 mission will not include SAREX. Ellen Ochoa will become the first person who holds a valid amateur radio license to fly aboard the shuttle without having the SAREX hardware onboard. *sigh* SAREX cannot fly on every mission no matter how much many of us would want it to. Most importantly the ground team couldn't handle that many missions without interfering with their actual jobs and other responsibilities. (You know - the ones which pay the mortgage and keep the boss happy who gives you permission to do SAREX activities in your spare time). Also there are many complicated missions with very intensive crew timelines where there just isn't enough time in the crew's schedule to justify SAREX's inclusions.

I have no special access to the astronaut's schedules or frequencies, but I do try to make my own contacts and tried many times during STS-64. (Well I'll admit that I tried to get Dick Richards KB5SIW to promise that he wouldn't take the shuttle home until he heard my call sign - but that's besides the point).

On my first good pass I heard Dick Richards doing random QSOs before he was to make a school contact - and heard him talking to a mutual friend in Houston. On the next pass Jerry Linenger was doing a school contact so there wasn't time for general QSOs. (BTW - that school pass set a new record for the number of questions answered by an astronaut - over 20!). Not surprisingly nobody was on the

radio during the rendezvous with the Spartan spacecraft or during
the EVA Spacewalk. But at least I tried, and will continue to try
in the future.

BTW - during the crew's postflight presentation they commented that
everybody wanted to talk with Susan Helms, even though she didn't
have a call sign. (She used Dick Richards as a control operator and
his call sign). They kidded about all of her boyfriends, and she
commented that she got to talk to 40-50 people. Carl meade also
tried random QSOs.

Overall the mission was incredibly successful, including SAREX. All
of SAREX's primary objectives (school contacts) were sucessfully
completed, and many random QSO passes were performed. If you didn't get
through - try again.

Philip Chien KC4YER
no sig yet

P.S. - next planned SAREX mission is STS-67 with the ASTRO-2 payload
scheduled for late February. The most enthusiastic ham on that
crew is certainly Dr. Ron Parise WA4SIR. Several other crewmembers
are also getting/have their licenses.

In Article <rtm-260994100806@kip-48.apple.com>
rtm@newton.apple.com (Bob Martin N6MZV) writes:
>Gerry, Mike-
>
>The SAREX crew does a great job, and provides us with a lot of challenges,
>some of them unintended.
>
>On the problem of 28 degree orbits, I took this as a challenge, and after
>running predictions for my location in northern CA (37.317302 N 122.055194
>W) I got up in the middle of the night for many nights for "good" 9 degree
>elevation passes. I learned a lot about my equipment and how to best use
>it. I also met a number of other hams in the area and in Southern
>California who were trying to work the Shuttle. I managed to make contact,
>with simple equipment, after a lot of work.
>
>The problem with this last mission (IMHO) was one of not setting
>expectations properly (and early). I didn't see any word preflight or
>early in the flight that SAREX activity was going to be constrained due to
>power budgets- I only saw this very late in the flight.
>
>What I'd appreciate seeing, either preflight or very early in the flight,
>would be a SAREX mission profile, posting information such as expected
>MET/orbit for deploying SAREX, expected operation (e.g. lotsa voice during
>the day and packet during sleep periods), when SAREX will be restowed, and
>for us MacSPOC users, which windows SAREX will be using.
>
>I'm looking forward to the next mission in October-
>

>--
>Bob Martin * rtm@newton.apple.com
>N6MZV * N6MZV @ N0ARY.#NOCAL.CA.USA.NOAM

1577. Re: APT Equipment Suggestions??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 12:29:25 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <36jkn5INNmda@gulfaero.com>
Source record: 26678

>I'm thinking about buying some hardware to get NOe, with no success.
ETEOSTAT) transmissions and I'm trying to decide on which
>hardware is good.

Try MultiFax. They use assembler code for the graphics drivers, and
store ALL of the APT signal. As you zoom in you pull up more and more
resolution of data not seen before. Other packages tend to store the APT
in memory, so a zoom only gets you a larger view of the same data.
MultiFax is also fairly inexpensive. To get the best picture they allow
you to record the birds signal as it passes, and play it back into
MultiFax later-this way the computer noise doe not effect you APT
download. This may make a difference here. My GateWay effects my ICOM
reception-even with after adjusting the bandwidth and notch filters.
Also, read Taggarts Satellite Handbook for more info.

Ken

1578. STS-68 Orbital State Vector Rev #17

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 14:51:04 UTC
From: astroman@netcom.com
Message-ID: <astromanCx0194.HII@netcom.com>
Source record: 26692
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94274.50272710648
10/01/1994 12:03:55.622 UTC
EFG E: -12272641.26 ft
F: 1473396.33 ft
G: -17765702.36 ft
Edot: -9020.6119 ft/s
Fdot: -22502.3520 ft/s
Gdot: 4362.0116 ft/s
ndot/2 (drag): 0.00136673066 rev/day^2
nddt/6: 7.68565E-08 rev/day^3
Bstar: 6.78387E-05 1/Earth Radii
Elset #: 3
Rev @ Epoch: 17.78269246691

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1579. Will an ICOM R7100 Work for APT/AVHRR Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 15:52:39 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <36k0k7INNk5c@gulfaero.com>
Source record: 26688

I have used an ICOM R9000 with success downloading APT/AVHRR signals, however I have a friend that wants to get into this a 'little' cheaper. Has anyone had any success getting APT/AVHRR downloads with success from an ICOM R7100. If so, did any adjustments have to be made to the bandwidth. I am not familiar with this unit, and do not know if there is an adjustment for this on the front control panel. I have info coming from ICOM, however I would rather hear from the real users of this equiptment.

Thanks in advance!

Ken

1580. History Channel

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 17:04:23 UTC
From: brian@nothing
Message-ID: <199410011704.KAA08841@nothing.ucsd.edu>
Source record: 26691

The History Channel seems to have appeared in-the-clear on F3-12.
- Brian

1581. Re: Is there a microsat FAQ?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 17:08:19 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <36k523$doe@newsstand.cit.cornell.edu>
Source record: 26690

In article <36hndj$r6a@hermes.unt.edu> Ron Parsons, rparsons@tcet.unt.edu writes:
In article <36hndj$r6a@hermes.unt.edu> Ron Parsons, rparsons@tcet.unt.edu writes:
>You asked a lot of questions, but I'll try. As far as stroe-and-forward
>sats, in general there are the 1200 bps ones and 9600 bps ones. Other
>than having to make minor mods to your rig, the 9600 ones are easiest to
>use and much faster also. UO-22, KO-23 and KO-25 are the current ones.
>You will need a 9600 bps modem, TAPR has a kit, but you need a modem
>disconnect header, which the 232 doesn't have I believe. I think TAPR
>also as a header add-on kit also. TAPR/AMSAT also now has a DSP modem
kit
>DSP-93. Contact AMSAT for software (you should be a member if you use
the
>sats.
>
>Ask more specific question and I'll try to answer.
>
>Ron W5RKN

Sounds like I'll need a new tnc, a new modem, and some expensive software. I've been an amsat member when I was more active, but I think I'm lapsed now. I was hoping to be able to do it as an incremental step up on the current station. The dsp modems still sound like the best way to deal with the changing states of digital communications, but it doesn't seem that they are very stable yet either.

Still, it would be a good way to keep in touch with the boat. How busy are the satellites?

Kevin

1582. Is there a microsat FAQ?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 17:20:20 UTC
From: rparsons@tcet.unt.edu
Message-ID: <36k5ok$l7l@hermes.unt.edu>
Source record: 26693

>Sounds like I'll need a new tnc, a new modem, and some expensive
>software.

Perhaps I didn't make myself clear. Your TNC (with mods) should be ok.
You will need a modem appropriate to the sat. The software is not expensive.
Most is available only for DOS (i'd suggest PB/PG/SatSked) or Windows
(I'd suggest WiSP) all available very cheaply from AMSAT.

If you will be going in for more than a single mode, then the DSP route
makes sense. The available DSP modems are VERY stable. Recommend AEA
DSP-2232 (good support), DSP-12 (support seems absent but the unit works
well), and soon to be available from TAPR -- DSP-93 kit.

The 9600 bps sats are very busy, but there's always room for one more.

Ron W5RKN

1583. STS-68 PAcket?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 20:06:30 UTC
From: bat@gdstech.GRUMMAN.COM
Message-ID: <BAT.94Oct1150630@gdstech.GRUMMAN.COM>
Source record: 26682

Is the current Shuttle mission expected to run the packet robot?
I have listened on some overhead passes, and heard nothing. I hope
145.55 is the correct listening frequency.
--
--
* Pat Masterson D12-25 | KE2LJ@KC2FD *
* Grumman Data Systems | 516-346-6316. *
* Bethpage, NY 11746 | bat@gdstech.grumman.com *

1584. Re: STS-68 PAcket?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 20:55:35 UTC
From: ghiscox@netcom.com
Message-ID: <ghiscoxCx0I4n.DA3@netcom.com>
Source record: 26684

Pat Masterson (bat@gdstech.GRUMMAN.COM) wrote:
: Is the current Shuttle mission expected to run the packet robot?
: I have listened on some overhead passes, and heard nothing. I hope
: 145.55 is the correct listening frequency.
: --
: *--*
: * Pat Masterson D12-25 | KE2LJ@KC2FD *
: * Grumman Data Systems | 516-346-6316. *
: * Bethpage, NY 11746 | bat@gdstech.grumman.com *

STS-68 is not a SAREX mission. There is no ham radio on board. Nuts!

George L. Hiscox	THE PRICE OF LIBERTY
ghiscox@netcom.com	IS ETERNAL VIGILANCE
WA6RIK @ WB6YMH.#soca.ca.usa.na	^^^^^^^^^^^^^^^^^

1585. Re: 2-line keps

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 21:14:33 UTC
From: briane@goofy.iaccess.za
Message-ID: <36kjfp$ul5@goofy.iaccess.za>
Source record: 26683

In article <199409271330.JAA00840@mtu.edu>,
dmgillah@mtu.EDU (David Gillahan) wrote:
> Howdy! I was wondering if anyone knows where I might anonymous FTP to for
> up-to-date 2-line keps data. Right now my local PBBS is down, and I had
> a hunch that maybe they're available on the internet...
>
> 73s
> --
> **
> * Talk to ya, Dave Attention all Skydivers: *
> * Until you've jumped *
> * Michigan Technological University into pitch blackness *
> * Where it's too &@#% cold! at 1250 feet with 80 *
> * dmgillah@mtu.edu pounds of combat gear, *
> * kb8por@w8yy.upmi.mi.usa.na YOUR STILL A LEG !!! *
> **

Best spot I've found so far is :

FTP to archive.afit.af.mil:/pub/space/....(anonymous login etc)

The files in here are updated daily by Dr Thomas Kelso at about 21h00-23h00.
I am not sure if this is EST or UTC time, maybe someone can tell me!!

There are about 12 files in this directory (/pub/space) with the extn of .tle
The most popular I should think are amateur.tle, weather.tle, sts.tle and
mir.tle.

Hope this is useful.

Cheerio,

Brian ZR5DTS Voice: ++27-31-7011201 (06:00-14:30 UTC)
Internet: briane@goofy.iaccess.za Fax: ++27-31-7090813
AX25 Packet: ZR5DTS@ZS5S.NTL.ZAF ICBM's: 29:51:05 S 30:53:59 E
****
I am glad I don't know everything, that way life isn't boring - Brian Ellse 94
****

1586. STS-68 Element Set (94274.824)

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 21:15:53 UTC
From: elements-request@alsys.com
Message-ID: <STS-68.94274.824@alsys.com>
Source record: 26687
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-68
1 23285U 94 62 A 94274.82461727 .00202885 22808-3 11661-3 0 58
2 23285 57.0042 71.6434 0008860 272.7255 87.2792 16.20264410 233

Satellite: STS-68
Catalog number: 23285
Epoch time: 94274.82461727 = (01 OCT 94 19:47:26.93 UTC)
Element set: 005
Inclination: 57.0042 deg
RA of node: 71.6434 deg Space Shuttle Flight STS-68
Eccentricity: .0008860 Keplerian element set JSC-005
Arg of perigee: 272.7255 deg from NASA flight Day 2 vector
Mean anomaly: 87.2792 deg
Mean motion: 16.20264410 rev/day Gil Carman
Decay rate: 2.02885e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 23

--
--
Gary Morris Internet: garym@alsys.com
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1587. test gateway

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 23:14:51 UTC
From: root@network
Message-ID: <199410012314.QAA13972@network.ucsd.edu>
Source record: 26685

test2

1588. test again

Newsgroup: rec.radio.amateur.space
Date: 1994-10-01 23:35:41 UTC
From: root@network
Message-ID: <199410012335.QAA14947@network.ucsd.edu>
Source record: 26686

again

1589. STS-68 Orbital State Vector Rev #22

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 01:43:37 UTC
From: astroman@netcom.com
Message-ID: <astromanCx0vGp.Jvl@netcom.com>
Source record: 26689
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94274.79518774305
10/01/1994 19:05:04.221 UTC
EFG E: 16407231.24 ft
F: -13879413.37 ft
G: -2614446.28 ft
Edot: 6052.5321 ft/s
Fdot: 11146.9931 ft/s
Gdot: -21175.9632 ft/s
ndot/2 (drag): 0.00129090203 rev/day^2
nddt/6: 6.85601E-08 rev/day^3
Bstar: 6.34825E-05 1/Earth Radii
Elset #: 4
Rev @ Epoch: 22.52301754345

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1590. orbs$273.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 03:28:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-273.n.1994@ampr.org>
Source record: 26694
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-273.N
2Line Orbital Elements 273.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX September 30, 1994
BID: $ORBS-273.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94271.03742138 -.00000351 00000-0 10000-3 0 3103
2 14129 26.8572 305.7899 6028491 214.5625 84.8801 2.05882968 84903
UO-11
1 14781U 84021B 94268.00144558 .00000063 00000-0 18490-4 0 7333
2 14781 97.7853 278.0514 0011286 316.0016 44.0298 14.69247006564960
RS-10/11
1 18129U 87054A 94268.02843046 .00000024 00000-0 97667-5 0 9605
2 18129 82.9213 255.0378 0013217 103.9971 256.2651 13.72341657363606
AO-13
1 19216U 88051B 94268.85908553 -.00000252 00000-0 10000-4 0 9673
2 19216 57.7254 229.1074 7234287 351.1080 0.8163 2.09723820 48123
FO-20
1 20480U 90013C 94267.85666911 -.00000043 00000-0 -32743-4 0 7289
2 20480 99.0534 40.9163 0541308 113.7310 252.1529 12.83227496216915
AO-21
1 21087U 91006A 94270.45240692 .00000094 00000-0 82657-4 0 5168
2 21087 82.9370 67.0209 0035263 157.2387 203.0290 13.74545468183639
RS-12/13
1 21089U 91007A 94271.56766864 .00000049 00000-0 35584-4 0 7336
2 21089 82.9192 294.7832 0028994 177.7183 182.4109 13.74047129182840
ARSENE
1 22654U 93031B 94262.03583661 -.00000123 00000-0 00000 0 0 2809
2 22654 2.0483 94.8577 2912797 191.9219 161.1305 1.42202795 2536
UO-14
1 20437U 90005B 94267.73275563 -.00000025 00000-0 73156-5 0 330
2 20437 98.5870 351.1405 0010299 260.0414 99.9603 14.29855473243814
AO-16
1 20439U 90005D 94267.78457414 -.00000009 00000-0 13585-4 0 8311
```

```
2 20439 98.5958 352.5326 0010595 261.0681 98.9301 14.29909495243836
DO-17
1 20440U 90005E 94267.72918637 -.00000008 00000-0 13802-4 0 8328
2 20440 98.5966 352.8356 0010733 260.0751 99.9213 14.30049404243845
WO-18
1 20441U 90005F 94271.76451361 .00000005 00000-0 18985-4 0 8350
2 20441 98.5960 356.8130 0011169 247.9646 112.0349 14.30023688244423
LO-19
1 20442U 90005G 94270.19646934 .00000021 00000-0 24903-4 0 8309
2 20442 98.5970 355.5485 0011476 252.3414 107.6519 14.30121238244214
UO-22
1 21575U 91050B 94271.75002581 -.00000008 00000-0 11919-4 0 5378
2 21575 98.4270 344.1110 0007774 348.3894 11.7113 14.36932512167958
KO-23
1 22077U 92052B 94271.88179524 -.00000037 00000-0 10000-3 0 4308
2 22077 66.0802 62.8714 0015417 262.7001 97.2266 12.86287673100122
AO-27
1 22825U 93061C 94267.75824516 -.00000007 00000-0 15224-4 0 3297
2 22825 98.6459 342.5288 0008049 282.3616 77.6664 14.27634788 51892
IO-26
1 22826U 93061D 94270.18478472 .00000002 00000-0 18795-4 0 3273
2 22826 98.6423 344.9794 0008520 275.0739 84.9475 14.27740073 52247
KO-25
1 22830U 93061H 94270.17228034 .00000013 00000-0 22445-4 0 3341
2 22830 98.5467 341.1307 0010700 237.2473 122.7684 14.28064200 52252
22828
1 22828U 93061F 94270.24174961 .00000005 00000-0 19779-4 0 3061
2 22828 98.6418 345.0583 0009417 258.9002 101.1119 14.28066941 20349
NOAA-9
1 15427U 84123A 94271.79179281 .00000046 00000-0 48781-4 0 9705
2 15427 99.0384 323.4350 0014404 289.7741 70.1868 14.13645402504891
NOAA-10
1 16969U 86073A 94271.87287141 -.00000000 00000-0 18015-4 0 8704
2 16969 98.5083 277.7167 0014108 29.6093 330.5882 14.24906282417263
MET-2/17
1 18820U 88005A 94271.20567382 .00000045 00000-0 27185-4 0 4100
2 18820 82.5436 186.6382 0015145 254.0416 105.9077 13.84721705336617
MET-3/2
1 19336U 88064A 94267.91426415 .00000051 00000-0 10000-3 0 3284
2 19336 82.5351 253.1054 0017739 17.5351 342.6386 13.16968747296389
NOAA-11
1 19531U 88089A 94271.87847883 .00000016 00000-0 33528-4 0 7886
2 19531 99.1817 263.3774 0011327 198.8816 161.1937 14.13017585309783
MET-2/18
1 19851U 89018A 94271.86552775 .00000030 00000-0 13585-4 0 3294
2 19851 82.5162 61.2547 0013971 302.5227 57.4585 13.84372473282038
MET-3/3
1 20305U 89086A 94270.32270566 .00000044 00000-0 10000-3 0 1549
2 20305 82.5530 199.3561 0008246 50.2543 309.9296 13.04405120236210
MET-2/19
```

```
1 20670U 90057A 94267.69635271 -.00000031 00000-0 -41105-4 0 8319
2 20670 82.5462 129.4460 0014456 227.5144 132.4786 13.84180745214385
FY-1/2
1 20788U 90081A 94272.07393375 -.00000027 00000-0 10000-4 0 1193
2 20788 98.8251 288.8720 0016829 85.9279 274.4232 14.01328042208257
MET-2/20
1 20826U 90086A 94268.39573962 .00000043 00000-0 25427-4 0 8400
2 20826 82.5209 66.2456 0014045 122.2702 237.9821 13.83589540201613
MET-3/4
1 21232U 91030A 94267.95954681 .00000050 00000-0 10000-3 0 7388
2 21232 82.5384 99.0681 0012485 301.6610 58.3305 13.16464435164486
NOAA-12
1 21263U 91032A 94271.80747351 .00000079 00000-0 54917-4 0 1973
2 21263 98.6090 297.2691 0012314 299.8832 60.1128 14.22450549175238
MET-3/5
1 21655U 91056A 94271.84562345 .00000051 00000-0 10000-3 0 7448
2 21655 82.5536 43.5279 0012447 302.5971 57.3939 13.16834041150109
MET-2/21
1 22782U 93055A 94268.13360374 .00000058 00000-0 40027-4 0 3397
2 22782 82.5469 127.2493 0022172 309.8933 50.0277 13.83015397 53902
POSAT
1 22829U 93061G 94267.72677565 .00000005 00000-0 19751-4 0 3216
2 22829 98.6432 342.5879 0009344 267.5753 92.4353 14.28041074 51902
MIR
1 16609U 86017A 94271.22973578 .00004416 00000-0 66357-4 0 7736
2 16609 51.6483 30.7759 0002346 71.0697 289.0604 15.57150756492070
HUBBLE
1 20580U 90037B 94269.92257599 .00000339 00000-0 18513-4 0 5399
2 20580 28.4706 302.4460 0006518 72.4139 287.7153 14.90678026 44586
GRO
1 21225U 91027B 94270.59000999 .00001939 00000-0 39127-4 0 1444
2 21225 28.4622 241.0410 0003021 288.8106 71.2173 15.41298504 72750
UARS
1 21701U 91063B 94270.85186363 .00001457 00000-0 14826-3 0 6002
2 21701 56.9851 107.6492 0004424 96.9163 263.2373 14.96485853166309
/EX
```

1591. Re: Tracking Prg for Ami?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 12:39:17 UTC
From: ANDRE_BREMER@AWORLD.aworld.de
Message-ID: <ujqn1MD192aRz1@aw80.aworld.aworld.de>
Source record: 26704

jamesb@clark.net (James Alex Brooks) wrote:

JB> I was just wondering if there is a sat tracking program for the Amiga
JB> computer? I have the A4000 and A2000. Mainl, I will be tracking the
JB> SATs with the A2000. Any info would help.

Hello!

I've got AmiSat by DG7YFQ which displays Satellites on a world map,
calculates antenna postitions and so on.
It works fine on any Amiga, I've tested it on an A 500 and on my
A 1200...

JB> Thanks,
JB>
JB>
JB> --
JB> James "Alex" Brooks
JB> ARS N4POE
JB> {Packet Station}
JB>

Greetings, Andre

--
****
Andre_Bremer@aworld.aworld.de | SMail: : Rosendahler Str. 92
Packet: DH4DAP @ DB0END.#NRW.DEU.EU | D- 58285 Gevelsberg
73 to all Ham's! (Phonie via DB0EN) | Voice: V+49-02332-4295

1592. Balloon Launch

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 13:42:25 UTC
From: biekert@phoenix.phoenix.net
Message-ID: <36mdc1$r3b@dolphin.phoenix.net>
Source record: 26695

Near Outer Space Transportation System (NOSTS-1)
Balloon Launch - Clear Lake Amateur Radio Club
Sunday - October 9, 1994

Near Outer Space Transportation System utilizing a 12 foot diameter helium balloon as the launch vehicle. NOSTS-1 is an amateur radio experiment which will carry a various payloads in a package weighing less than 6 pounds. All interested hams are invited to participate.

The payload consists of:

* 2 meter packet on 145.75 MHz simplex - the node name for digipeating is NOSTS-1, the mailbox callsign is KJ5MX-6, the beacon IDs as KJ5MX-3.

* 10 meter voice beacon on 28.322 MHz Double Side-Band with an ID interval of 33 seconds

* Beacon on 29.420 MHz sending "CW" beeps that correspond directly to the outside temperature. At 70 degrees Fahrenheit the beep rate is approximately 200/min. To calculate temperature from beep rate the formula: Temp(degrees F) = [0.56853 X (Beep rate)] - 38
The antenna for this device is a 2 meter dipole cut to enhance the 5th harmonic at 147.10 MHz for direction finding purposes.

* Beacon on 224.72 MHz for direction finding purposes only.

* Potential secondary payloads may include a 10 GHz gigaplexer beacon and a 2 meter uplink (147.435 MHz), 70 cm downlink (440.95 MHz) FM repeater. Final announcements on these payloads will be made on launch day.

The Clear Lake Amateur Radio Club Balloon Launch Team wishes to thank Andy MacAllister, WA5ZIB and members of the South Texas Balloon Launch Team for assistance, advice, and use of 220 MHz beacon, 29.420 MHz fireball transmitter for this launch.

An informal simultaneous HF (7.155 Mhz or up for QRM) and UHF (442.750 SE Houston | 444.275 MHz NW Houston repeaters) net will be held at 7PM on Saturday October 8th for final updates. The 40 meter net on the same frequency will be active immediately before and during the flight.

The lauch site will be west of the Houston area and the direction of flight will be from west to east. Coverage may extend several states on some modes. Reception reports including frequency, time, and YOUR location are encouraged.

For additional information and reception reports contact:

Dan Feeback, KJ5MX - (713) 286-0230 [Home] - (713) 483-7189 [Work]
Internet: feeback@medics.jsc.nasa.gov
Packet: KJ5MX@KA5KTH.#SETX.TX.USA.NOAM
or

John Maca, AB5SS - (713) 488-2025 [Home] - (713) 244-7774 [Work]
Internet: jmaca%jscdk@jesnic.jsc.nasa.gov
Packet: AB5SS@KA5KTH.#SETX.TX.USA.NOAM

--
Robert E. Biekert KA5GLX Houston, Texas
Email: biekert@phoenix.phoenix.net

1593. GPS Info?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 13:43:24 UTC
From: genef@netcom.com
Message-ID: <genefCx1ssC.1Bo@netcom.com>
Source record: 26696

Hi! Just curious...where can I get info on GPS? I'm wondering what kind of GPS receiver I should get.

TIA

Gene--

--
genef@netcom.com

1594. ANS-274 BULLETINS

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 18:53:01 UTC
From: Dave Cowdin <cowdin@pogo.den.mmc.com>
Message-ID: <$ans-274.01.1994@ampr.org>
Source record: 26700
Cross-posted to: rec.radio.amateur.space,rec.radio.info

SB SAT @ AMSAT $ANS-274.01
IARU APPOINTS SATELLITE ADVISOR

HR AMSAT NEWS SERVICE BULLETIN 274.01 FROM AMSAT HQ
SILVER SPRING, MD OCTOBER 1, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-274.01

IARU Appoints Satellite Adviser

In a news release dated 26-SEP-94, the International Amateur Radio Union (IARU) announced that it has appointed Hans van de Groenendaal (ZS5AKV) to the newly created post of IARU Satellite Adviser. According to the IARU release, the principle task of this position will be to keep the IARU Administrative Council informed on all technical and operational aspects of the Amateur Radio Satellite Service in order to enable the Council to adopt appropriate policies to advance the interest of the Amateur Satellite Service before the International Telecommunication Union (ITU) and regional telecommunications agencies.

The IARU release noted that ZS5AKV, as past President of Southern African AMSAT and an Executive Committee member of IARU Region 1, brings many years of satellite related experience to this appointment. The IARU release further noted that the appointment is a direct result of recommendations made to the IARU Administrative Council by the IARU Ad Hoc Satellite Advisory Committee which took up the interim report at the recently completed IARU Administrative Committee meeting in Singapore. The IARU release commented that this action is "tangible proof" of IARU's interest and involvement in the Amateur Satellite Service.

The release continued by citing IARU's many year role in protecting the Amateur Satellite Service, in particular its work during the 1979 World Administrative Radio Conference which led to most of the present Amateur Satellite Service frequency allocations.

The IARU release also stated that the "exponential development of new technologies and ever increasing complexity of the Regulatory Agencies, the IARU Administrative Council deemed it necessary to involve itself closer with the Amateur Satellite Service in order to represent it effectively on a coordinated world-wide basis while cementing its relationship with the AMSAT and other Amateur Radio Satellite groups."

In the release the IARU said that in his new capacity and by the powers delegated to him by the IARU, ZS5AKV will have the task of appointing someone to the post of IARU Satellite Frequency Coordinator.

The IARU said that ZS5AKV is now soliciting nominations for volunteers willing to serve the function of IARU Satellite Frequency Coordinator. Such nominations should be sent to him by FAX at +27-31-765-6456 or via INTERNET at amsat@uctvax.uct.ac.za before 31-OCT-94. Hans said that each nomination should include a comprehensive summary of the nominee's background and qualifications. He stated that it is his intention to discuss the various nominations with major AMSAT groups in order to seek their recommendations. He underscored the importance of finding the right person to be appointed to this very important job.

/EX
SB SAT @ AMSAT $ANS-274.02
WEEKLY OSCAR STATUS REPORTS

HR AMSAT NEWS SERVICE BULLETIN 274.02 FROM AMSAT HQ
SILVER SPRING, MD OCTOBER 1, 1994
TO ALL RADIO AMATEURS BT
BID: $ANS-274.02

Weekly OSCAR Status Reports: 01-OCT-94

AO-13: Current Transponder Operating Schedule:
N QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Sep 12 - Dec 19
Mode-B : MA 30 to MA 150 |<- OFF Oct 22 - Nov 07 for eclipses
Mode-B : MA 150 to MA 190 | max duration 2h 12m
Mode-BS : MA 190 to MA 218 |
Mode-S : MA 218 to MA 220 |<- S beacon only
Mode-S : MA 220 to MA 230 |<- S transponder; B trsp. is OFF
Mode-B : MA 230 to MA 30 | Blon/Blat 230/0
Omnis : MA 250 to MA 140 | Move to attitude 180/0, Dec 19
The battery charge state is of paramount importance during the eclipse seasons. As always the command team may have to have to make temporary changes to the published schedule. In that case we will try to minimize the inconvenience, setting Mode-B OFF from MA 230-256 in the first instance.
==========
[G3RUH/DB2OS/VK5AGR]

FO-20: FO-20 has been switched back into the analog mode as of 14:30 UTC 28-SEP-94. The command station announced that "mailbox software ran away" and there is a malfunction known as UVC (Under Voltage Control) has been confirmed by command station. FO-20 will be staying in its analog mode until 10-OCT-94. [JJ1WTK]

MIR: German Astronaut Dr. Ulf Merbold will be QRV aboard the space station MIR signing DP3MIR during the ESA EUROMIR 94 mission starting 03-OCT-1994. In order to give actual information regarding the mission to as many radio amateurs and SWLs as possible, he will use the digital voice memory of MIR's HAM RADIO rig designed and built by Thomas Kieselbach (DL2MDE). Thomas made an arrangement with Ulf Merbold, DP3MIR, to load actual spoken reports into the digital memory frequently, as time permits however, probably every 2-3 days. The reports in English and German will then be retransmitted auto-matically during the consecutive orbits at 145.550 Mhz (FM) in regular time

intervals. Ulf Merbold will stay aboard MIR for 30 days. [DF5DP]

RS-10: WA6ARA reports that RS-10 is operating well with a good mix of SSB and CW. Orbit times are great for late evenings to the East and with early evening passes to the West. [WA6ARA]

RS-12: WA6ARA reports that Mode-K is alive and very well. RS-12 is just starting to appear in late evenings. Over the next month the passes will be great for evening passes. [WA6ARA]

The AMSAT NEWS Service (ANS) is looking for volunteers to contribute weekly OSCAR status reports. If you have a favorite OSCAR which you work on a regular basis and would like to contribute to this bulletin, please send your observations to WD0HHU at his CompuServe address of 70524,2272, on INTERNET at wd0hhu@amsat.org, or to his local packet BBS in the Denver, CO area, WD0HHU @ N0QCU. Also, if you find that the current set of orbital elements are not generating the correct AOS/LOS times at your QTH, PLEASE INCLUDE THAT INFORMATION AS WELL. The information you provide will be of value to all OSCAR enthusiasts.

/EX

1595. Shuttle frequencies

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 21:05:08 UTC
From: william@cortex.ama.ttuhsc.edu
Message-ID: <Pine.3.89.9410021603.A21465-0100000@cortex>
Source record: 26697

Although I don't think we have the equipment to recieve shuttle
conversations with hams, we'd like to try.

What frequencies do the shuttle missions use for talking to hams ?

Do they use any modes other than FM and packet ? Do they use an offset
between transmit/recieve or is it strictly simplex ?

Also, the last Keplerian data I had for the shuttle was from PRE-launch.
Does anybody have newer data or know where I can find it ?

Thanks,
Reddy
KC5JIF

1596. sat. help

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 22:36:02 UTC
From: Andrew Naylor <anaylor@delphi.com>
Message-ID: <ZY3Vgj6.anaylor@delphi.com>
Source record: 26698

What are the sats that I can work with just standard AX.25 1200 baud packet? I have 2 meter and 440 to work with. I have worked through CW and voice on some sats, but what are the requirements for running the pacsats?
Thanks in advance
N0UJT

1597. Re: Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-10-02 23:05:58 UTC
From: Griffin@ridgefield.sdr.slb.com
Message-ID: <Griffin-0210941917460001@slip27.ridgefield.sdr.slb.com>
Source record: 26699

In article <36dr7pINNn48@diable.upc.es>, caralt@gaig.upc.es (Jordi Caralt Barba) wrote:

blank

Jordi: You have 6 postings here on Sept 29th but you forgot to include any text!

1598. STS-68 Orbital State Vector Rev #38

Newsgroup: rec.radio.amateur.space
Date: 1994-10-03 03:52:20 UTC
From: astroman@netcom.com
Message-ID: <astromanCx2w38.Ky8@netcom.com>
Source record: 26701
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94275.79509405093
10/02/1994 19:04:56.126 UTC
EFG E: 10631138.23 ft
F: 5512595.32 ft
G: -18023940.28 ft
Edot: -14456.0829 ft/s
Fdot: 19791.2534 ft/s
Gdot: -2467.7027 ft/s
ndot/2 (drag): 0.00142009791 rev/day^2
nddt/6: 8.29567E-08 rev/day^3
Bstar: 6.84552E-05 1/Earth Radii
Elset #: 6
Rev @ Epoch: 38.73161606215

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1599. STS-68 Orbital State Vector Rev #50

Newsgroup: rec.radio.amateur.space
Date: 1994-10-03 14:37:35 UTC
From: astroman@netcom.com
Message-ID: <astromanCx3pyo.8Cr@netcom.com>
Source record: 26702
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94276.50123519676
10/03/1994 12:01:46.721 UTC
EFG E: 2514157.25 ft
F: -13874820.34 ft
G: 16407933.33 ft
Edot: 18067.6634 ft/s
Fdot: 14067.4224 ft/s
Gdot: 9120.5219 ft/s
ndot/2 (drag): 0.00181325949 rev/day^2
nddt/6: 1.35224E-07 rev/day^3
Bstar: 8.53899E-05 1/Earth Radii
Elset #: 7
Rev @ Epoch: 50.17990446847

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
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1600. ARLS032 Listen for Mir beacon

Newsgroup: rec.radio.amateur.space
Date: 1994-10-03 15:45:41 UTC
From: w1aw@arrl.org
Message-ID: <$arls032.1994@ampr.org>
Source record: 26703
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS032
ARLS032 Listen for Mir beacon

ZCZC AS76
QST de W1AW
Space Bulletin 032 ARLS032
From ARRL Headquarters
Newington, CT October 3, 1994
To all radio amateurs

SB SPACE ARL ARLS032
ARLS032 Listen for Mir beacon

German astronaut Dr. Ulf Merbold will be active aboard the space station MIR, signing DP3MIR, during the European Space Agency's EUROMIR 94 mission, scheduled to begin October 3.

Dr Merbold will give ''information regarding the mission'' using a digital voice memory designed and built by Thomas Kieselbach, DL2MDE. Kieselbach has arranged with Dr Merbold to load actual spoken reports into the digital memory as frequently as time permits, probably every two to three days, according to Norbert Notthoff, DF5DP, the Deutscher Amateur Radio Club's Coordinator for Satellites and Space Projects.

The reports in English and German will be retransmitted automatically on 145.550 MHz FM.

Dr Merbold will stay aboard MIR for 30 days.
NNNN
/EX

1601. STS-68 Element Set (94276.675)

Newsgroup: rec.radio.amateur.space
Date: 1994-10-03 16:30:57 UTC
From: elements-request@alsys.com
Message-ID: <STS-68.94276.675@alsys.com>
Source record: 26705
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-68
1 23285U 94 62 A 94276.67518413 .00136094 11322-4 71939-4 0 73
2 23285 57.0063 62.7154 0009256 276.8039 83.1971 16.20939096 537

Satellite: STS-68
Catalog number: 23285
Epoch time: 94276.67518413 = (03 OCT 94 16:12:15.90 UTC)
Element set: 007
Inclination: 57.0063 deg
RA of node: 62.7154 deg Space Shuttle Flight STS-68
Eccentricity: .0009256 Keplerian element set JSC-007
Arg of perigee: 276.8039 deg from NASA flight Day 4 vector
Mean anomaly: 83.1971 deg
Mean motion: 16.20939096 rev/day Gil Carman
Decay rate: 1.36094e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 53

--
--
Gary Morris Internet: garym@alsys.com
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1602. STS-68 Orbital State Vector Rev #54

Newsgroup: rec.radio.amateur.space
Date: 1994-10-03 22:09:42 UTC
From: astroman@netcom.com
Message-ID: <astromanCx4Aw7.BBL@netcom.com>
Source record: 26706
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94276.79440543981
10/03/1994 19:03:56.630 UTC
EFG E: -7064770.32 ft
F: 19082549.38 ft
G: -7358058.37 ft
Edot: -14916.1528 ft/s
Fdot: 2025.4518 ft/s
Gdot: 19563.8739 ft/s
ndot/2 (drag): 0.00176167675 rev/day^2
nddt/6: 1.27630E-07 rev/day^3
Bstar: 8.20883E-05 1/Earth Radii
Elset #: 8
Rev @ Epoch: 54.93352456212

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1603. Re: Shuttle TLE Mailing List?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-03 23:18:39 UTC
From: garym@alsys.com
Message-ID: <Cx4E33.3ru@alsys.com>
Source record: 26707
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space

In <HALLIDAY.94Sep30195649@netcom.com> halliday@netcom.com (Mark Halliday) writes:
>I used to get daily TLE updates on a mailing list.
>Is this service still available? If so, please
>send info. Thanks.

I get lots of inquiries about the mailing list. Attached is a copy of the latest (just revised today) help/info file for the Shuttle Elements Mailing List. Note that the mailing list moved to a listserver in July and everyone on the old list had to resubscribe, if you didn't, that is why you aren't getting anything.
--GaryM

----------<cut here>----------<cut here>----------<cut here>----------

Shuttle Elements Mailing List
Information File

Table of Contents (941003)

(1) July 94 List Changes
(2) Purpose of the Shuttle Elements Mailing List
(3) How to subscribe and unsubscribe
(4) How to access the elements archives
(5) In case of problems.

(1) July 94 List Changes

In July 1994 the Elements Mailing List changed from a manually operated mailing list to a listserv list, subscribers on the old list were all sent a notice about the change. The old archive server is also gone, since the new listserv software also has file archive and retrieval commands. You can now subscribe, unsubscribe, change your mailing address, and access the archive all by sending requests to an automated listserver, at the "listserv@alsys.com" address. The elements-request address is no longer used to subscribe/unsubscribe to the list.

(2) Purpose of the Shuttle Elements Mailing List

The purpose of this list is to get Space Shuttle Keplerian elements out as quickly as possible during shuttle flights. Subscribers will receive pre-launch predicted elements, rotated pre-launch elements right after launch (to compensate for launch delays), and post launch elements based on either Shuttle computer state vector data or on NORAD radar tracking data. Basically you will be getting the most up to date data I and several others can put together.

The data sent to the list will be primarily Two-Line Element Sets, but also some AMSAT format element sets, and sometimes both. If you want information about the Two-Line Element Set format, Dr TS Kelso posts a format description article to USENET newsgroups rec.radio.amateur.misc and sci.space. If you don't have access to USENET you can get a copy from the email elements archive server.

All elements sets are sent to all list subscribers as soon as they are released. If you want to get the most recent Shuttle element set sent to the list, you can retrieve it from the elements archive maintained by the listserver. Send email to the listserv address, "listserv@alsys.com", with the text of the mail containing the following command:

get elements last-shuttle-elset

For more information on the archive server, you can send the command "help" to the listserv address. The listserver has elements for many previous Shuttles and general information regarding element data.

This list is a moderated list for data distribution only, it is not a discussion list. Submissions to the list are by prior arrangement only.

Please unsubscribe from the list if you email account will be closing or update your address if it is going to change (send "help set" for more information). If we receive unknown host or user mailer error messages from your account your subscription is subject to termination without notice.

(3) How to subscribe and unsubscribe

To subscribe to the Shuttle Elements Mailing List you send a command in an email message to "listserv@alsys.com". The command must be the first line of text in your email message and there must be nothing in the text portion of your message preceding the command. To subscribe the command is like this, except you use your name instead of John Smith:

subscribe elements John Smith

The command should be the first line of text in your mail message, nothing may precede the command (except of course the mail headers). You will get a confirmation back in the email with your password. Your password will be used in the future should you want to change your address or unsubscribe to the mailing list.

To unsubscribe from the elements list, send the following command:

unsubscribe elements

To change your email address after you have subscribed, send the following command:

set elements address <password> <new-address>

(4) How to access the elements archives

If you are interested in accessing files in the archives, you can send a message containing the word "help" to get the complete set of instructions.

The following index commands will tell you what files are available.

index elements
index elements/data
index elements/info

The most commonly used command on the listserver is:

get elements last-shuttle-elset

(5) In case of problems.

First, get the help file, send the command "help" to listserv@alsys.com,
or if you have problems with a set command, send the command "help set"
to the listserv.

If you get a message back that says your command was unrecognized, make
sure the you or your mail system is not putting headers or markers in the
beginning of the text part of your message. Some mailers put ----------
in the beginning of the text, if yours does this you need to disable that
"feature".

In you have problems with the listserv that you can't solve after reading
the help files, you may write to me at garym@alsys.com or call me at my
number below. If you call outside normal office hours, you can leave a
message on my voice mail. If you need a reply back be sure to give your
Internet address (spell it out if it's not clear) so I can reply by email,
I do not return long distance phone calls, nor do I have time for phone tag.
In any case, email is preferrred, you will get a quicker response that way.

--
Gary Morris Internet: garym@alsys.com
KK6YB Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128

1604. Re: GPS Info?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 16:34:04 UTC
From: wdunckel1@aol.com
Message-ID: <36s05s$kjg@newsbf01.news.aol.com>
Source record: 26708

In article <genefCx1ssC.1Bo@netcom.com>, genef@netcom.com (Gene Fornario) writes:

Trimble Navigation in Sunnyvale makes some very nice GPS units. They make many different models for many different uses. Some will hook up to a serial port other for backpacking etc. I own a Sony and my only complaint is the batteries are consumed very quickly. Also, how hard would it have been to add a serial port? Another function that would have been nice is one that would turn the GPS unit on at an adjustable increment to recieve position, then turn of again.
Any GPS unit should have functions including waypoints,speed,altitude,direction of travel, direction to waypoints,and of course lat,lon. My Sony will give you a graphic display of the path you traveled.

Hope some of this helps!
Walt Dunckel (KD6VYV)

1605. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 17:09:34 UTC
From: tkelso@dolphin.afit.af.mil
Message-ID: <tkelso.781290564@afit.af.mil>
Source record: 26712

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 68
1 23285U 94062A 94275.58333333 .00014195 11047-4 85804-5 0 111
2 23285 57.0059 67.9832 0008838 274.3118 193.2264 16.20480153 340
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1606. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 17:26:54 UTC
From: tkelso@dolphin.afit.af.mil
Message-ID: <tkelso.781291605@afit.af.mil>
Source record: 26713

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space and rec.radio.amateur.misc on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated several times weekly. Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (updated weekly) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAAAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a twenty-two-character name (this change is being made to be consistent with the name length in the NORAD SATCAT).

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1607. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 18:09:33 UTC
From: tkelso@dolphin.afit.af.mil
Message-ID: <tkelso.781294163@afit.af.mil>
Source record: 26714

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 68
1 23285U 94062A 94277.25000000 .00017840 11063-4 98995-5 0 189
2 23285 56.9934 59.9329 0010373 282.5118 193.2450 16.21002677 619
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1608. Satellite Tracking for Windoze

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 19:24:40 UTC
From: ae517@FreeNet.Carleton.CA
Message-ID: <Cx5xx5.6wI@freenet.carleton.ca>
Source record: 26709

Hope this isn't already in a FAQ, but what shareware is available to try
for satellite tracking in the Windows world, and where could one FTP it?

any hints would be appreciated.

de va3rr/aa8lu
ae517@freenet.carleton.ca
or
renaudr@tc.gc.ca

1609. ARLK044 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 21:34:54 UTC
From: w1aw@arrl.org
Message-ID: <$arlk044.1994@ampr.org>
Source record: 26710
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK044
ARLK044 Keplerian data

ZCZC SK12
QST de W1AW
Keplerian Bulletin 44 ARLK044
From ARRL Headquarters
Newington, CT October 4, 1994
To all radio amateurs

SB KEP ARL ARLK044
ARLK044 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-68
1 23285U 94062A 94273.71398473 .00126891 00000-0 63979-4 0 40
2 23285 57.0074 76.9956 0009327 267.4500 92.5492 16.19853975 52
AO-10
1 14129U 83058B 94272.49345949 -.00000206 00000-0 10000-3 0 3124
2 14129 26.8510 305.5389 6029381 214.9865 84.0238 2.05881116 56961
RS-10/11
1 18129U 87054A 94268.02843046 .00000024 00000-0 97667-5 0 9605
2 18129 82.9213 255.0378 0013217 103.9971 256.2651 13.72341657363606
UO-11
1 14781U 84021B 94268.00144558 .00000063 00000-0 18490-4 0 7333
2 14781 97.7853 278.0514 0011286 316.0016 44.0298 14.69247006564960
RS-12/13
1 21089U 91007A 94271.56766864 .00000049 00000-0 35584-4 0 7336
2 21089 82.9192 294.7832 0028994 177.7183 182.4109 13.74047129182840
AO-13
1 19216U 88051B 94268.85908553 -.00000252 00000-0 10000-4 0 9673
2 19216 57.7254 229.1074 7234287 351.1080 0.8163 2.09723820 16623
UO-14
1 20437U 90005B 94267.73275563 -.00000025 00000-0 73156-5 0 330
2 20437 98.5870 351.1405 0010299 260.0414 99.9603 14.29855473243814
AO-16
1 20439U 90005D 94267.78457414 -.00000009 00000-0 13585-4 0 8311
2 20439 98.5958 352.5326 0010595 261.0681 98.9301 14.29909495243836
```

```
DO-17
1 20440U 90005E 94267.72918637 -.00000008 00000-0 13802-4 0 8328
2 20440 98.5966 352.8356 0010733 260.0751 99.9213 14.30049404243845
WO-18
1 20441U 90005F 94271.76451361 .00000005 00000-0 18985-4 0 8350
2 20441 98.5960 356.8130 0011169 247.9646 112.0349 14.30023688244423
LO-19
1 20442U 90005G 94270.19646934 .00000021 00000-0 24903-4 0 8309
2 20442 98.5970 355.5485 0011476 252.3414 107.6519 14.30121238244214
FO-20
1 20480U 90013C 94267.85666911 -.00000043 00000-0 -32743-4 0 7289
2 20480 99.0534 40.9163 0541308 113.7310 252.1529 12.83227496216915
AO-21
1 21087U 91006A 94270.45240692 .00000094 00000-0 82657-4 0 5168
2 21087 82.9370 67.0209 0035263 157.2387 203.0290 13.74545468183639
UO-22
1 21575U 91050B 94271.75002581 -.00000008 00000-0 11919-4 0 5378
2 21575 98.4270 344.1110 0007774 348.3894 11.7113 14.36932512167958
KO-23
1 22077U 92052B 94271.88179524 -.00000037 00000-0 10000-3 0 4308
2 22077 66.0802 62.8714 0015417 262.7001 97.2266 12.86287673100122
KO-25
1 22830U 93061H 94270.17228034 .00000013 00000-0 22445-4 0 3341
2 22830 98.5467 341.1307 0010700 237.2473 122.7684 14.28064200 52252
KO-25?
1 22828U 93061F 94270.24174961 .00000005 00000-0 19779-4 0 3061
2 22828 98.6418 345.0583 0009417 258.9002 101.1119 14.28066941 20349
IO-26
1 22826U 93061D 94270.18478472 .00000002 00000-0 18795-4 0 3273
2 22826 98.6423 344.9794 0008520 275.0739 84.9475 14.27740073 52247
AO-27
1 22825U 93061C 94267.75824516 -.00000007 00000-0 15224-4 0 3297
2 22825 98.6459 342.5288 0008049 282.3616 77.6664 14.27634788 51892
PO-28
1 22829U 93061G 94267.72677565 .00000005 00000-0 19751-4 0 3216
2 22829 98.6432 342.5879 0009344 267.5753 92.4353 14.28041074 51902
Mir
1 16609U 86017A 94273.34756036 .00005602 00000-0 82268-4 0 7781
2 16609 51.6474 20.1699 0002736 77.8457 282.2842 15.57179690492401

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Saturday,
October 8, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1610. STS-68 Orbital State Vector Rev #67

Newsgroup: rec.radio.amateur.space
Date: 1994-10-04 22:20:45 UTC
From: astroman@netcom.com
Message-ID: <astromanCx662M.IJ0@netcom.com>
Source record: 26711
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94277.54398976852
10/04/1994 13:03:20.716 UTC
EFG E: -12822303.22 ft
F: -14515807.32 ft
G: 9632559.39 ft
Edot: 16548.5837 ft/s
Fdot: -2576.2427 ft/s
Gdot: 18131.4826 ft/s
ndot/2 (drag): 0.00184420775 rev/day^2
nddt/6: 1.39831E-07 rev/day^3
Bstar: 8.30041E-05 1/Earth Radii
Elset #: 9
Rev @ Epoch: 67.08916694787

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1611. Re: sat. help

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 03:56:06 UTC
From: grumpyken@aol.com
Message-ID: <36t84m$3ot@newsbf01.news.aol.com>
Source record: 26724

In article <ZY3Vgj6.anaylor@delphi.com>, Andrew Naylor
<anaylor@delphi.com> writes:

Hi Andrew,

>What are the sats that I can work with just standard AX.25 1200 baud
>packet?

That I'm aware of the only 1200 baud FSK bird is presently the Russian
space station MIR. If you're interested, you can copy telemetry from DOVE
(DO-17). FO-20 is not a pacsat type, but it uses 1200 baud PSK (I
believe!).

>what are the requirements for running the pacsats?

Since you're already working the birds on voice, you've got the hard part
licked. The question you have to ask is: do to you want to work the 1200
baud PSK birds or the 9600 birds? Either way it's going to be an extra
expenditure. If you have a TNC that can accept another modem via an
alternate header then you only have to buy the modem and not a whole
TNC. Also, if you want to work the 9600 baud birds you have to have a
radio
that transmits true FM as opposed to phase modulation, such as the
FT-736 or TS-790A, and you have to be willing to make the modification
to connect directly to the discriminator and varactor. Lastly, you need
software for the pacsat protocol suite. Presently there are two versions
out there: PB and PG are a text-based system for downloading and upload-
ing to the birds respectively; WiSP is a Windoze-based set of applications
that is 'way-cool' and is pretty much what everybody is moving to.
Well, I hope that answers your questions. I'd be happy to answer any
further
ones you have. Hope to see you on the digital birds soon!

73's & CUL de N4SMY, - Ken -

1612. GOES CONVERTER//1691 1694.5

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 04:54:40 UTC
From: charles.lowrance@warpdrv.com
Message-ID: <94100501184328@warpdrv.com>
Source record: 26727

I AM LOOKING FOR A DOWNCONVERTER FOR GOES 1691 AND 1694.5
TO 137.5MHZ///
I HAVE DISH/FEED HORN AND PREAMP///
PLEASE SEND INFO TO CHAELES.LOWRANCE@WARPDRV.COM
THANKS...CHARLIE WA4MCK

1613. Re: Satellite Tracking for Windoze

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 07:01:17 UTC
From: chris@zl2tpo.actrix.gen.nz
Message-ID: <251@zl2tpo.actrix.gen.nz>
Source record: 26728

In article <Cx5xx5.6wI@freenet.carleton.ca>, Russ Renaud (ae517@FreeNet.Carleton.CA) writes:
>
>Hope this isn't already in a FAQ, but what shareware is available to try
>for satellite tracking in the Windows world, and where could one FTP it?

WiSP is aMicrosat groundstation program for Windows. It also has some reasonably basic tracking functions. It is available on ftp.ucsd.edu in the hamradio/incoming directory. Most files are located in the file WISPxxxx.zip (xxxx being the date and I can't remember it). I uploaded a new GSC today and it is in the file GSC083E.ZIP.

73 Chris ZL2TPO
zl2tpo@amsat.org

1614. EZSATS - Why they're missing

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:47:05 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tp69$le6@usenet.INS.CWRU.Edu>
Source record: 26715

EZSATS off Packet due to Lightning Hit
BID$ EZINF000

Our only local packet BBS, WD9ESU.WI.USA.NOAM, took a direct lightning hit on Sept 25 and his entire station, including the computers, radios, TNCs and antennas, was reduced to charred rubble.

N9KAN was posting the EZSAT satellite pass times for me via WD9ESU and that is no longer possible. Since quite a few people use these bulletins, I'm going to post them to this newsgroup and ask that someone upload them to packet for me. I've put BID numbers in the bulletins for the first time so duplicates can be deleted by packet sysops.

I'll return to sending them via packet as soon as we get re-connected to the outside world, but right now south central Wisconsin is in a black hole, as far as nationwide packet access is concerned. Boy, you never know what you've got until it's gone!

Please post this message too so that people who have been wondering what happened to the bulletins know what's going on.

Thanks and 73,
Dave, N9LTD
formerly at WD9ESU.WI.USA.NOAM
Now try
djmullen@facstaff.wisc.edu (best) or
dt650@cleveland.freenet.edu or
Sysop at Clear Skies BBS, Madison, WI (608) 249-7130

1615. EZSATS Sat Passes 10/03-10/09

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:49:17 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpad$len@usenet.INS.CWRU.Edu>
Source record: 26716

```
Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD
BID$ EZE0000
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 03 Oct 94
MIR 05:46i 07:19e 08:56g 10:34i 12:11i 13:47f 15:24g
OSCAR-21 08:25f 10:10F 12:03I 19:24g 21:09E 22:58I
RS-10/11 06:58i 08:42c 10:29H 20:28g 22:13D
RS-12/13 00:17c 02:04H 09:32i 11:16e 13:02G 23:01h
DOVE 03:07h 04:45C 06:28I 15:22i 16:59d 18:39H
AO-27 02:28h 04:06D 05:50I 14:44i 16:22c 18:02H
Tue 04 Oct 94
MIR 06:24h 08:00f 09:38i 11:16i 12:52h 14:28e 16:06i
OSCAR-21 07:11i 08:52d 10:39H 18:08i 19:51e 21:37G
RS-10/11 00:04I 07:27h 09:12C 11:00I 19:18i 20:57e 22:44G
RS-12/13 00:45C 02:34I 09:59h 11:44A 13:31H 23:28f
DOVE 02:39i 04:16c 05:57H 16:30g 18:10F 19:52I
AO-27 02:03i 03:39b 05:21H 15:55f 17:35G 19:18I
Wed 05 Oct 94
MIR 05:30i 07:05c 08:42h 10:20i 11:57h 13:33c 15:10i
OSCAR-21 07:37h 09:20C 11:09I 18:34h 20:19A 22:06H
RS-10/11 06:14i 07:57f 09:43F 19:45h 21:27B 23:15H
RS-12/13 01:13F 03:06I 10:27g 12:12E 14:01I 22:15i 23:56c
DOVE 02:13i 03:47f 05:27G 16:02h 17:40D 19:22I
AO-27 01:38i 03:13e 04:53G 15:29h 17:08E 18:50I
Thr 06 Oct 94
MIR 04:37i 06:10e 07:47g 09:25i 11:02i 12:38f 14:15g
OSCAR-21 08:03f 09:48F 11:40I 19:01g 20:46E 22:35I
RS-10/11 06:42i 08:27c 10:13H 20:13g 21:57E 23:49I
RS-12/13 01:43H 09:11i 10:55e 12:41G 22:41h
DOVE 03:19g 04:57E 06:42I 15:34i 17:11c 18:52H
AO-27 01:15I 02:47g 04:26F 06:13I 15:03i 16:41b 18:22H
Fri 07 Oct 94
MIR 05:15g 06:51f 08:29i 10:07i 11:43h 13:19e 14:57i
OSCAR-21 06:49i 08:30d 10:17H 17:45i 19:29e 21:15G
RS-10/11 07:12h 08:57D 10:45I 19:02i 20:42e 22:28G
RS-12/13 00:24C 02:13I 09:38h 11:23B 13:10H 23:07f
DOVE 02:51h 04:28A 06:10I 15:08I 16:42f 18:22G
```

AO-27 02:21h 03:59C 05:42I 14:38i 16:15d 17:55H
Sat 08 Oct 94
MIR 04:21i 05:56c 07:33h 09:11i 10:48h 12:24c 14:01i
OSCAR-21 07:14h 08:57B 10:47I 18:12h 19:56b 21:43H
RS-10/11 05:58i 07:41f 09:27G 19:29h 21:12A 23:00H
RS-12/13 00:53F 02:45I 10:06g 11:51E 13:40I 21:54i 23:35d
DOVE 02:24i 03:59e 05:39H 16:14h 17:53E 19:34I
AO-27 01:56i 03:32c 05:14H 15:48g 17:28F 19:10I
Sun 09 Oct 94
MIR 03:28i 05:01e 06:37h 08:16i 09:53i 11:29f 13:05g
OSCAR-21 07:41g 09:26F 11:18I 18:39g 20:24E 22:13I
RS-10/11 06:27i 08:11b 09:58H 19:57g 21:42E 23:34I
RS-12/13 01:22H 08:51i 10:34e 12:20G 22:20h
DOVE 01:58I 03:30g 05:09F 15:45i 17:24A 19:04I
AO-27 01:31i 03:06f 04:46G 15:22h 17:01D 18:42I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

These satellites can be received with 2-meter or HF rigs. All times are
for the start of the pass. An average pass is 10-15 minutes long. For late
breaking news, listen to the EZSATS feature on `This Week in Amateur Radio',
Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1616. EZSATS Sat Passes 10/10-10/16

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:50:36 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpct$lfg@usenet.INS.CWRU.Edu>
Source record: 26717

```
Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD
BID$ EZE0001
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 10 Oct 94
MIR 04:06g 05:42f 07:20i 08:57i 10:34h 12:10e 13:48i
OSCAR-21 06:27i 08:08d 09:54H 17:23i 19:06e 20:52G
RS-10/11 06:56g 08:42D 10:30I 18:46i 20:26d 22:13G
RS-12/13 00:03C 01:52I 09:18h 11:02B 12:49H 22:47f
DOVE 03:02h 04:40C 06:23I 15:18i 16:55e 18:35H
AO-27 02:40g 04:18E 06:04I 14:56i 16:34b 18:15H
Tue 11 Oct 94
MIR 03:12i 04:46d 06:24h 08:02i 09:39h 11:15b 12:52i
OSCAR-21 06:52h 08:35B 10:24I 17:49h 19:34a 21:21H
RS-10/11 05:43i 07:26e 09:12G 19:13h 20:56B 22:45I
RS-12/13 00:32F 02:24I 09:45g 11:31E 13:19I 21:33i 23:14c
DOVE 02:35i 04:11c 05:52H 16:26g 18:05F 19:47I
AO-27 02:14h 03:51B 05:34I 14:31i 16:07e 17:47G
Wed 12 Oct 94
MIR 02:18i 03:51e 05:28h 07:06i 08:44i 10:20f 11:56g
OSCAR-21 07:18g 09:03F 10:55I 18:17g 20:02E 21:50I
RS-10/11 06:11h 07:56b 09:43H 19:42g 21:27F 23:19I
RS-12/13 01:01H 08:30i 10:13e 11:59G 21:59h 23:42C
DOVE 02:09i 03:42f 05:22G 15:57h 17:36C 19:17I
AO-27 01:49i 03:25d 05:06H 15:41g 17:20F 19:02I
Thr 13 Oct 94
MIR 02:57g 04:33f 06:10i 07:48i 09:25g 11:01e 12:39i
OSCAR-21 06:05i 07:45d 09:32H 17:01i 18:44e 20:30G
RS-10/11 06:41g 08:26E 10:15I 18:30i 20:11d 21:58H
RS-12/13 01:32I 08:57h 10:41A 12:28H 22:26f
DOVE 03:14h 04:52E 06:37I 15:29i 17:07c 18:47H
AO-27 01:25i 02:59f 04:38G 15:15h 16:53C 18:35I
Fri 14 Oct 94
MIR 02:02i 03:37c 05:15h 06:53i 08:29h 10:06d 11:43i
OSCAR-21 06:30h 08:13B 10:02I 17:27h 19:12a 20:58H
RS-10/11 05:27i 07:11e 08:57G 18:57h 20:41C 22:30I
RS-12/13 00:11F 02:04I 09:25g 11:10E 12:59I 21:13i 22:53c
DOVE 02:46i 04:23b 06:05I 16:38f 18:17G 20:01I
```

AO-27 02:33h 04:11D 05:56I 14:49i 16:27c 18:07H
Sat 15 Oct 94
MIR 01:09i 02:42d 04:19h 05:57i 07:34i 09:10f 10:47h
OSCAR-21 06:56g 08:41F 10:33I 17:54g 19:39E 21:28I
RS-10/11 05:56h 07:41A 09:28H 19:26f 21:11F 23:05I
RS-12/13 00:41H 08:09i 09:52e 11:39G 21:38h 23:22C
DOVE 02:20i 03:54e 05:35G 16:09h 17:48E 19:30I
AO-27 02:07h 03:44b 05:26I 14:25I 16:00f 17:40G 19:24I
Sun 16 Oct 94
MIR 01:47g 03:23f 05:01i 06:39i 08:15g 09:51e 11:30i
OSCAR-21 05:43i 07:23d 09:10G 16:39i 18:22e 20:07G
RS-10/11 06:25g 08:11E 10:00I 18:14i 19:55c 21:43H
RS-12/13 01:11I 08:36h 10:21A 12:08H 22:05f 23:50F
DOVE 03:26g 05:05F 06:51I 15:41i 17:19a 18:59H
AO-27 01:42i 03:18e 04:58H 15:34g 17:13E 18:55I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

These satellites can be received with 2-meter or HF rigs. All times are
for the start of the pass. An average pass is 10-15 minutes long. For late
breaking news, listen to the EZSATS feature on `This Week in Amateur Radio',
Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1617. EZSATS Eastern Pass Times 10/17-10/23

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:52:08 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpfo$lgp@usenet.INS.CWRU.Edu>
Source record: 26718

```
Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD
BID$ EZE0002
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 17 Oct 94
MIR 00:53h 02:28d 04:05h 05:43i 07:20h 08:56b 10:33i 23:59i
OSCAR-21 06:08h 07:50B 09:39I 17:05i 18:49b 20:36H
RS-10/11 05:11i 06:55d 08:41G 18:42h 20:25C 22:15I
RS-12/13 01:43I 09:04g 10:49E 12:38I 20:52i 22:33c
DOVE 02:58h 04:35C 06:18I 15:14i 16:50e 18:30G
AO-27 01:19i 02:52g 04:31F 15:08h 16:46B 18:27I
Tue 18 Oct 94
MIR 01:33e 03:09h 04:47i 06:25i 08:01f 09:37h
OSCAR-21 06:34g 08:18E 10:10I 17:32g 19:17D 21:05I
RS-10/11 05:40h 07:25B 09:12I 17:33i 19:10f 20:56F 22:50I
RS-12/13 00:20H 07:48i 09:32e 11:18G 21:18h 23:01C
DOVE 02:31i 04:06d 05:47H 16:21g 18:00F 19:42I
AO-27 02:26h 04:04C 05:47I 14:42i 16:19d 18:00H
Wed 19 Oct 94
MIR 00:38g 02:14g 03:52i 05:29i 07:06g 08:42e 10:20i 23:43h
OSCAR-21 05:21i 07:01d 08:47G 16:16i 17:59f 19:45G
RS-10/11 04:29I 06:10g 07:55F 09:45I 17:58i 19:40b 21:28H
RS-12/13 00:50I 08:15h 10:00A 11:47H 21:44f 23:30F
DOVE 02:05i 03:38f 05:17G 15:53h 17:31C 19:12I
AO-27 02:00i 03:37b 05:19H 15:53f 17:33G 19:16I
Thr 20 Oct 94
MIR 01:18c 02:56h 04:34i 06:10h 07:47d 09:24i 22:49i
OSCAR-21 05:45h 07:28B 09:17H 16:42i 18:27b 20:13H
RS-10/11 04:56i 06:40d 08:26H 18:26h 20:10D 22:00I
RS-12/13 01:22I 08:43g 10:28E 12:17I 20:31i 22:12d 23:59H
DOVE 03:10h 04:48D 06:31I 15:25i 17:02d 18:42H
AO-27 01:36i 03:11e 04:51G 15:27h 17:06D 18:47I
Fri 21 Oct 94
MIR 00:23d 02:00h 03:38i 05:15h 06:51f 08:28h 23:28g
OSCAR-21 06:11g 07:56E 09:48I 17:09h 18:55D 20:43I
RS-10/11 05:25h 07:10B 08:57I 17:17i 18:55f 20:41G 22:37I
RS-12/13 07:28i 09:11e 10:57G 20:57h 22:40C
DOVE 02:42i 04:19b 06:00H 16:33g 18:13G 19:56I
```

AO-27 02:44g 04:23F 06:10I 15:01i 16:39a 18:20H
Sat 22 Oct 94
MIR 01:04f 02:42i 04:20i 05:56g 07:32e 09:11i 22:34h
OSCAR-21 04:59i 06:38e 08:25G 15:54i 17:37f 19:23G
RS-10/11 04:12i 05:54f 07:40F 09:31I 17:43i 19:24b 21:13H
RS-12/13 00:29I 07:54h 09:39B 11:26H 21:24f 23:09F
DOVE 02:15i 03:50f 05:30G 16:05h 17:43D 19:25I
AO-27 02:19h 03:56C 05:40I 14:36i 16:12e 17:52H
Sun 23 Oct 94
MIR 00:09d 01:46h 03:24i 05:01h 06:37b 08:14i 21:40i 23:13d
OSCAR-21 05:23h 07:06A 08:54H 16:20i 18:04b 19:51H
RS-10/11 04:40i 06:24c 08:11H 18:10g 19:55D 21:45I
RS-12/13 01:01I 08:22g 10:07E 11:56I 20:10i 21:51d 23:38H
DOVE 03:22g 05:00E 06:45I 15:37i 17:14b 18:55H
AO-27 01:54i 03:30c 05:11H 15:46g 17:25F 19:08I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

These satellites can be received with 2-meter or HF rigs. All times are
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Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1618. EZSATS Eastern Pass Times 10/24-10/30

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:54:11 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpjj$lie@usenet.INS.CWRU.Edu>
Source record: 26719

```
Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD
BID$ EZE0003
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 24 Oct 94
MIR 00:50h 02:28i 04:05i 05:42f 07:18h 22:18g 23:54g
OSCAR-21 05:49g 07:34E 09:25I 16:47h 18:32D 20:20I
RS-10/11 05:09h 06:54C 08:42I 17:00i 18:39e 20:26G
RS-12/13 07:07i 08:50e 10:36G 20:36h 22:19C
DOVE 02:54h 04:31A 06:13I 15:10i 16:45f 18:25G
AO-27 01:29i 03:03f 04:43G 15:19h 16:58D 18:40I
Tue 25 Oct 94
MIR 01:32i 03:10i 04:46g 06:23f 08:01i 21:24h 22:59d
OSCAR-21 04:36i 06:16e 08:02G 15:32i 17:14f 19:00G
RS-10/11 03:56i 05:39f 07:25F 17:27h 19:09b 20:57H
RS-12/13 00:09I 07:34h 09:18b 11:05H 21:03f 22:48F
DOVE 02:27i 04:02d 05:42H 16:17g 17:56E 19:37I
AO-27 02:37g 04:16E 06:01I 14:54i 16:32b 18:12H
Wed 26 Oct 94
MIR 00:36h 02:14i 03:51h 05:27a 07:04i 20:30i 22:03d 23:40h
OSCAR-21 05:01h 06:43A 08:32H 15:58i 17:42b 19:28H
RS-10/11 04:24i 06:09c 07:55H 17:55g 19:39E 21:31I
RS-12/13 00:41I 08:01g 09:47E 11:35I 19:50i 21:30d 23:17H
DOVE 02:01i 03:33g 05:13F 15:48i 17:27B 19:07I
AO-27 02:12h 03:49B 05:32I 14:29i 16:05e 17:45G
Thr 27 Oct 94
MIR 01:18i 02:56h 04:32f 06:08h 21:08g 22:45g
OSCAR-21 05:27g 07:11E 09:02I 16:25h 18:10D 19:58I
RS-10/11 04:54h 06:39D 08:27I 16:44i 18:24e 20:10G
RS-12/13 06:46i 08:29e 10:15G 20:15h 21:58B 23:48I
DOVE 03:05h 04:43C 06:26I 15:21i 16:58d 18:38H
AO-27 01:47i 03:23d 05:03H 15:39g 17:18F 19:00I
Fri 28 Oct 94
MIR 00:22i 02:00i 03:37g 05:13f 06:51i 20:14h 21:49d 23:26h
OSCAR-21 04:14i 05:54e 07:40G 15:10i 16:52f 18:38G
RS-10/11 03:40i 05:23f 07:09G 17:11h 18:54A 20:42H
RS-12/13 07:13h 08:57A 10:44H 20:42f 22:27F
DOVE 02:38i 04:14c 05:55H 16:29g 18:08F 19:51I
```

AO-27 01:23i 02:56f 04:36G 15:12h 16:51C 18:32I
Sat 29 Oct 94
MIR 01:04i 02:41h 04:17b 05:54i 19:20i 20:54d 22:30h
OSCAR-21 04:39h 06:21A 08:09H 15:35i 17:20c 19:06H
RS-10/11 04:09i 05:53b 07:40H 17:39g 19:24E 21:16I
RS-12/13 00:20I 07:40g 09:26E 11:14I 19:29i 21:10d 22:57H
DOVE 02:11i 03:45f 05:25G 16:00h 17:39C 19:20I
AO-27 02:30h 04:09D 05:53I 14:47i 16:24c 18:05H
Sun 30 Oct 94
MIR 00:09i 01:46h 03:22f 04:58h 19:59g 21:35g 23:13i
OSCAR-21 05:05g 06:49E 08:40I 16:02h 17:47C 19:35I
RS-10/11 04:38g 06:24D 08:12I 16:28i 18:08d 19:55G
RS-12/13 06:25i 08:08e 09:54G 19:55h 21:38B 23:27I
DOVE 03:17h 04:55E 06:40I 15:32i 17:10c 18:50H
AO-27 02:05i 03:42a 05:24I 15:58f 17:38G 19:21I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

These satellites can be received with 2-meter or HF rigs. All times are
for the start of the pass. An average pass is 10-15 minutes long. For late
breaking news, listen to the EZSATS feature on `This Week in Amateur Radio',
Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1619. EZSATS Western Pass Times 10/03-10/09

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:55:32 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpm4$llg@usenet.INS.CWRU.Edu>
Source record: 26720

```
Easy Sats West - Western US Satellite UTC Pass Times de N9LTD
BID$ EZW0000
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 03 Oct 94
MIR 07:19i 08:52d 10:29h 12:07i 13:44h 15:20d 16:57h
OSCAR-21 00:14I 08:30i 10:10d 11:57G 19:24i 21:08e 22:54G
RS-10/11 01:18I 08:42h 10:27B 12:14I 20:35i 22:13f 23:59F
RS-12/13 00:19h 02:02B 03:51H 11:16h 13:00b 14:47H
DOVE 03:14i 04:47g 06:26F 08:13I 17:01i 18:39b 20:20H
AO-27 02:35i 04:08g 05:48F 16:23h 18:02B 19:43H
Tue 04 Oct 94
MIR 07:57g 09:34f 11:11h 12:49h 14:25f 16:01g
OSCAR-21 08:55h 10:37A 12:26H 19:51h 21:35a 23:22H
RS-10/11 01:52I 07:29i 09:12f 10:57F 12:47I 21:01i 22:43b
RS-12/13 00:46g 02:31E 04:22I 11:43g 13:29E 15:17I 23:33i
DOVE 04:19h 05:56C 07:39I 16:33i 18:10e 19:50G
AO-27 03:42h 05:20D 07:04I 15:58i 17:35d 19:15H
Wed 05 Oct 94
MIR 07:03h 08:38c 10:16h 11:53i 13:30h 15:06d 16:44i
OSCAR-21 09:21g 11:06E 12:57I 20:18g 22:03D 23:51I
RS-10/11 00:30H 07:57i 09:41c 11:28H 21:29g 23:13D
RS-12/13 01:13d 03:00G 10:28i 12:11e 13:57G 23:58h
DOVE 03:51i 05:27c 07:09H 17:41g 19:21F 21:02I
AO-27 03:17i 04:54b 06:35H 17:09g 18:48F 20:31I
Thr 06 Oct 94
MIR 06:09i 07:43d 09:20h 10:58i 12:35h 14:11c 15:48h
OSCAR-21 08:08i 09:48d 11:34G 19:02i 20:45e 22:31G
RS-10/11 01:03I 08:26h 10:12C 11:59I 20:18i 21:58e 23:44G
RS-12/13 01:41B 03:30H 10:55h 12:39a 14:26H
DOVE 03:24i 04:59f 06:38G 17:13h 18:51C 20:32I
AO-27 02:52i 04:27e 06:08G 16:42h 18:21D 20:03I
Fri 07 Oct 94
MIR 06:48g 08:24f 10:02h 11:40h 13:16f 14:52g
OSCAR-21 08:32h 10:15B 12:04H 19:29h 21:13b 23:00H
RS-10/11 01:38I 07:13i 08:56f 10:42F 12:32I 20:45h 22:27b
RS-12/13 00:25g 02:10E 04:01I 11:22g 13:08D 14:56I 23:12i
DOVE 04:30h 06:09D 07:53I 16:45i 18:22d 20:02H
```

AO-27 02:28i 04:01g 05:40F 07:26I 16:16i 17:55a 19:35H
Sat 08 Oct 94
MIR 05:54h 07:29c 09:06h 10:44i 12:21h 13:57d 15:35i
OSCAR-21 08:59g 10:43E 12:34I 19:56g 21:41D 23:29I
RS-10/11 00:15H 07:42i 09:26c 11:13H 21:13g 22:57E
RS-12/13 00:52d 02:39G 10:07i 11:50e 13:36G 23:37h
DOVE 04:03h 05:40b 07:21H 17:53f 19:33G 21:15I
AO-27 03:35h 05:13C 06:56I 15:51i 17:28e 19:08G
Sun 09 Oct 94
MIR 05:00i 06:34d 08:11h 09:49i 11:26h 13:02c 14:39h
OSCAR-21 07:45i 09:25e 11:12G 18:40i 20:23f 22:09G
RS-10/11 00:48I 08:11h 09:56D 11:44I 20:02i 21:42e 23:28G
RS-12/13 01:20B 03:09H 10:34h 12:19a 14:05H
DOVE 03:36i 05:11e 06:51G 17:25h 19:04D 20:45I
AO-27 03:10i 04:46c 06:28H 17:02g 18:41F 20:23I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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for the start of the pass. An average pass is 10-15 minutes long. For late
breaking news, listen to the EZSATS feature on `This Week in Amateur Radio',
Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1620. EZSATS Western Pass Times 10/10-10/16

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:56:27 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpns$lnc@usenet.INS.CWRU.Edu>
Source record: 26721

```
Easy Sats West - Western US Satellite UTC Pass Times de N9LTD
BID$ EZW0001
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 10 Oct 94
MIR 05:39g 07:15f 08:53h 10:30h 12:07f 13:43g
OSCAR-21 08:10h 09:53A 11:41H 19:06i 20:51b 22:37H
RS-10/11 06:57i 08:41f 10:27G 20:29h 22:12A
RS-12/13 00:04g 01:49E 03:40I 11:02g 12:47D 14:35I 22:51i
DOVE 03:10i 04:42g 06:21F 08:07I 16:56i 18:35b 20:15H
AO-27 02:45i 04:20f 06:00G 16:35h 18:14C 19:55I
Tue 11 Oct 94
MIR 04:45h 06:20d 07:57h 09:35i 11:12g 12:48d 14:25i
OSCAR-21 08:36g 10:21E 12:12I 19:33g 21:19D 23:06I
RS-10/11 00:00H 07:26i 09:11b 10:57H 20:57g 22:42E
RS-12/13 00:32d 02:18G 09:46i 11:30e 13:16G 23:17h
DOVE 04:14h 05:52B 07:34I 16:29i 18:06e 19:45G
AO-27 03:54g 05:33E 07:18I 16:09i 17:47c 19:28H
Wed 12 Oct 94
MIR 03:51i 05:25d 07:02h 08:39i 10:16h 11:53d 13:29h
OSCAR-21 07:23i 09:03e 10:49G 18:18i 20:01f 21:47G
RS-10/11 00:33I 07:55g 09:41D 11:29I 19:46i 21:27d 23:13G
RS-12/13 01:00B 02:48H 10:13h 11:58a 13:45H 23:43g
DOVE 03:47i 05:23d 07:04H 17:37g 19:16E 20:58I
AO-27 03:28h 05:06A 06:48I 15:45i 17:21f 19:01G 20:44I
Thr 13 Oct 94
MIR 02:59i 04:30g 06:06g 07:44h 09:21h 10:57f 12:34g
OSCAR-21 07:48h 09:30A 11:19H 18:44i 20:28b 22:15H
RS-10/11 06:42i 08:25e 10:11G 20:13h 21:56B 23:45H
RS-12/13 01:28E 03:20I 10:41g 12:26D 14:14I 22:30i
DOVE 03:20i 04:54f 06:34G 17:08h 18:47B 20:27I
AO-27 03:03i 04:39d 06:20H 16:54g 18:34E 20:15I
Fri 14 Oct 94
MIR 03:35h 05:11d 06:48h 08:26i 10:02g 11:38e 13:16i
OSCAR-21 08:14g 09:58E 11:49I 19:11h 20:56D 22:44I
RS-10/11 07:10h 08:55b 10:42H 20:42g 22:27E
RS-12/13 00:11d 01:57G 09:25i 11:09e 12:55G 22:56h
DOVE 04:26h 06:04D 07:48I 16:41i 18:18d 19:58H
```

```
AO-27 02:39i 04:13f 05:53G 16:28h 18:07B 19:48I
Sat 15 Oct 94
MIR 02:41i 04:15c 05:52h 07:30i 09:07h 10:43c 12:20h
OSCAR-21 07:01i 08:41e 10:27G 17:55i 19:38f 21:24G
RS-10/11 00:18I 07:40g 09:25E 11:14I 19:30i 21:11d 22:58G
RS-12/13 00:39B 02:27H 09:52h 11:37b 13:24H 23:23g
DOVE 03:58i 05:35b 07:17H 17:49g 19:28F 21:10I
AO-27 03:47h 05:25D 07:09I 16:03i 17:40d 19:20H
Sun 16 Oct 94
MIR 01:49i 03:20g 04:57g 06:34h 08:12h 09:48f 11:24g
OSCAR-21 07:26h 09:08b 10:56H 18:22i 20:06b 21:52H
RS-10/11 06:26i 08:10e 09:56G 19:58h 21:41B 23:30I
RS-12/13 01:07E 02:59I 10:20g 12:05E 13:53I 22:10i 23:50d
DOVE 03:31i 05:06e 06:46G 17:20h 18:59D 20:40I
AO-27 03:22h 04:59a 06:41H 17:14f 18:53G 20:36I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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for the start of the pass. An average pass is 10-15 minutes long. For late
breaking news, listen to the EZSATS feature on `This Week in Amateur Radio',
Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)
```

1621. EZSATS Western Pass Times 10/17-10/23

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:57:32 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpps$lns@usenet.INS.CWRU.Edu>
Source record: 26722

```
Easy Sats West - Western US Satellite UTC Pass Times de N9LTD
BID$ EZW0002
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 17 Oct 94
MIR 02:26h 04:01d 05:39h 07:16i 08:53g 10:29d 12:07i
OSCAR-21 07:52g 09:36E 11:27I 18:49h 20:34D 22:21I
RS-10/11 06:55h 08:40A 10:27H 20:26f 22:11F
RS-12/13 01:37G 09:05i 10:48e 12:34G 22:35h
DOVE 04:38g 06:16E 08:02I 16:52i 18:30b 20:10H
AO-27 02:57i 04:32e 06:13H 16:47h 18:26E 20:08I
Tue 18 Oct 94
MIR 01:32i 03:06c 04:43h 06:21i 07:58h 09:34c 11:11h
OSCAR-21 06:39i 08:18e 10:05G 17:33i 19:16f 21:02F
RS-10/11 00:04I 05:44I 07:24g 09:10E 10:59I 19:14i 20:56c 22:43H
RS-12/13 00:18B 02:07H 09:32h 11:16b 13:03H 23:02g
DOVE 04:10h 05:47B 07:30I 16:26i 18:01f 19:41G 21:24I
AO-27 02:33i 04:06g 05:45F 07:32I 16:21i 18:00A 19:40H
Wed 19 Oct 94
MIR 00:39i 02:11g 03:47g 05:25h 07:02h 08:38f 10:15g
OSCAR-21 07:04h 08:46a 10:34H 17:59i 19:44c 21:30H
RS-10/11 06:10i 07:54d 09:41G 19:42h 21:26C 23:15I
RS-12/13 00:47E 02:38I 09:59g 11:45D 13:33I 21:49i 23:29d
DOVE 03:43i 05:18d 06:59H 17:32h 19:11E 20:53I
AO-27 03:40h 05:18C 07:02I 15:56i 17:33d 19:13H
Thr 20 Oct 94
MIR 01:16h 02:52e 04:29h 06:07i 07:43g 09:19e 10:57i
OSCAR-21 07:29g 09:14E 11:04I 18:26h 20:11C 21:59I
RS-10/11 06:39h 08:24A 10:11H 18:33i 20:11f 21:56F 23:49I
RS-12/13 01:16G 08:44i 10:27e 12:13G 22:14h 23:57B
DOVE 03:16i 04:50g 06:29F 17:04i 18:42B 20:23H
AO-27 03:15i 04:51c 06:33H 17:06g 18:46F 20:28I
Fri 21 Oct 94
MIR 00:22i 01:56c 03:33h 05:11i 06:48h 08:24b 10:01h 23:29i
OSCAR-21 06:17i 07:56e 09:42G 17:11i 18:54f 20:39F
RS-10/11 05:27i 07:09g 08:55E 10:44I 18:59i 20:40c 22:28H
RS-12/13 01:46H 09:11h 10:55a 12:42H 22:41g
DOVE 04:22h 05:59D 07:43I 16:36i 18:13e 19:53H
```

AO-27 02:50i 04:25e 06:05G 16:40h 18:19D 20:00I
Sat 22 Oct 94
MIR 01:01f 02:37g 04:15h 05:53h 07:29f 09:05g
OSCAR-21 06:41h 08:23a 10:11H 17:37i 19:21c 21:08H
RS-10/11 05:55i 07:39d 09:25G 19:26h 21:10D 23:00I
RS-12/13 00:26E 02:17I 09:38g 11:24D 13:12I 21:28i 23:08d
DOVE 03:54i 05:30c 07:12H 17:44g 19:24F 21:06I
AO-27 02:27I 03:59g 05:38E 07:23I 16:14i 17:52b 19:33H
Sun 23 Oct 94
MIR 00:07h 01:42d 03:19h 04:57i 06:34g 08:10e 09:48i 23:12i
OSCAR-21 07:07g 08:51E 10:42I 18:04h 19:49C 21:36I
RS-10/11 06:24h 08:09B 09:56I 18:17i 19:55f 21:41F 23:34I
RS-12/13 00:55G 08:23i 10:06e 11:52G 21:54h 23:36A
DOVE 03:27i 05:02f 06:41G 17:16h 18:54C 20:35I
AO-27 03:33h 05:11B 06:54I 15:49i 17:26e 19:06G

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1622. EZSATS Western Pass Times 10/24-10/30

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 08:58:53 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tpse$lor@usenet.INS.CWRU.Edu>
Source record: 26723

```
Easy Sats West - Western US Satellite UTC Pass Times de N9LTD
BID$ EZW0003
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 24 Oct 94
MIR 00:47d 02:24h 04:01i 05:38h 07:14c 08:51i 22:20i 23:51f
OSCAR-21 05:55i 07:34e 09:20G 11:15I 16:49i 18:31f 20:17F 22:07I
RS-10/11 05:11i 06:54f 08:39F 10:29I 18:43i 20:25b 22:12H
RS-12/13 01:25H 08:50h 10:35a 12:21H 22:20g
DOVE 04:33g 06:12E 07:56I 16:48i 18:25c 20:06H
AO-27 03:08i 04:44c 06:25H 16:59g 18:39F 20:21I
Tue 25 Oct 94
MIR 01:28g 03:06h 04:43h 06:19f 07:56g 22:57h
OSCAR-21 06:19i 08:01b 09:49H 17:15i 18:59c 20:45H
RS-10/11 05:39i 07:23c 09:10H 19:11g 20:55D 22:45I
RS-12/13 00:05E 01:56I 09:18g 11:03D 12:51I 21:07i 22:48d
DOVE 04:06h 05:43A 07:25I 16:22I 17:56f 19:36G 21:19I
AO-27 02:43i 04:18f 05:58G 16:33h 18:12C 19:53I
Wed 26 Oct 94
MIR 00:32d 02:10h 03:47i 05:24g 07:00e 08:38i 22:03i 23:37c
OSCAR-21 06:45g 08:29D 10:19I 17:42h 19:27C 21:14I
RS-10/11 06:08h 07:54C 09:41I 18:01i 19:40e 21:26G 23:20I
RS-12/13 00:34G 08:02i 09:46e 11:32G 21:33h 23:16A
DOVE 03:38i 05:14e 06:54H 17:28h 19:07E 20:48I
AO-27 03:52g 05:30E 07:15I 16:07i 17:45c 19:25H
Thr 27 Oct 94
MIR 01:14h 02:52i 04:28h 06:05c 07:42i 21:10i 22:42f
OSCAR-21 05:33i 07:12f 08:57G 10:52I 16:26i 18:09f 19:55F 21:45I
RS-10/11 04:55i 06:38f 08:24F 10:14I 18:27h 20:09b 21:57H
RS-12/13 01:04H 08:29h 10:14a 12:00H 22:00g 23:44E
DOVE 03:12i 04:45g 06:24F 08:11I 16:59i 18:38b 20:18H
AO-27 03:26h 05:03B 06:46I 15:43i 17:18f 18:58G 20:41I
Fri 28 Oct 94
MIR 00:18g 01:56h 03:33h 05:09f 06:46g 21:47h 23:22e
OSCAR-21 05:57i 07:39b 09:27H 16:52i 18:36c 20:23H
RS-10/11 05:24i 07:08c 08:55H 18:55g 20:39E 22:30I
RS-12/13 01:36I 08:57g 10:42D 12:30I 20:47i 22:27d
DOVE 04:17h 05:55C 07:38I 16:32i 18:09e 19:48G
```

AO-27 03:01i 04:37d 06:18H 16:52g 18:31E 20:13I
Sat 29 Oct 94
MIR 01:00h 02:37i 04:14g 05:50e 07:28i 20:53i 22:27b
OSCAR-21 06:23g 08:07D 09:57I 17:19h 19:04C 20:51I
RS-10/11 05:53h 07:38C 09:26I 17:44i 19:24e 21:10G
RS-12/13 00:14G 07:41i 09:25e 11:11G 11:28G 21:12h 22:55B
DOVE 03:50i 05:26c 07:07H 17:40g 19:19F 21:01I
AO-27 02:37i 04:11f 05:50F 16:26h 18:05B 19:45I
Sun 30 Oct 94
MIR 00:04h 01:42i 03:19h 04:55c 06:32i 20:00i 21:32f 23:08g
OSCAR-21 05:11i 06:49f 08:35G 10:29I 16:04i 17:47f 19:32F 21:22I
RS-10/11 04:39i 06:23f 08:09F 18:11h 19:54A 21:42H
RS-12/13 00:44H 08:08h 09:53b 11:40H 21:39g 23:24E
DOVE 03:23i 04:57f 06:37G 17:11h 18:50B 20:31I
AO-27 03:45h 05:23D 07:07I 16:00i 17:38d 19:18H

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1623. EZSATS - Eastern Passes 10/03-11/01

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 09:06:53 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36tqbd$lvk@usenet.INS.CWRU.Edu>
Source record: 26725

Please don't post these to packet - they contain four weeks worth of pass
times for the Eastern half of the country and are too long for packet.

Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD

Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 28Sep
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 03 Oct 94
MIR 05:46i 07:19e 08:56g 10:34i 12:11i 13:47f 15:24g
OSCAR-21 08:25f 10:10F 12:03I 19:24g 21:09E 22:58I
RS-10/11 06:58i 08:42c 10:29H 20:28g 22:13D
RS-12/13 00:17c 02:04H 09:32i 11:16e 13:02G 23:01h
DOVE 03:07h 04:45C 06:28I 15:22i 16:59d 18:39H
AO-27 02:28h 04:06D 05:50I 14:44i 16:22c 18:02H
Tue 04 Oct 94
MIR 06:24h 08:00f 09:38i 11:16i 12:52h 14:28e 16:06i
OSCAR-21 07:11i 08:52d 10:39H 18:08i 19:51e 21:37G
RS-10/11 00:04I 07:27h 09:12C 11:00I 19:18i 20:57e 22:44G
RS-12/13 00:45C 02:34I 09:59h 11:44A 13:31H 23:28f
DOVE 02:39i 04:16c 05:57H 16:30g 18:10F 19:52I
AO-27 02:03i 03:39b 05:21H 15:55f 17:35G 19:18I
Wed 05 Oct 94
MIR 05:30i 07:05c 08:42h 10:20i 11:57h 13:33c 15:10i
OSCAR-21 07:37h 09:20C 11:09I 18:34h 20:19A 22:06H
RS-10/11 06:14i 07:57f 09:43F 19:45h 21:27B 23:15H
RS-12/13 01:13F 03:06I 10:27g 12:12E 14:01I 22:15i 23:56c
DOVE 02:13i 03:47f 05:27G 16:02h 17:40D 19:22I
AO-27 01:38i 03:13e 04:53G 15:29h 17:08E 18:50I
Thr 06 Oct 94
MIR 04:37i 06:10e 07:47g 09:25i 11:02i 12:38f 14:15g
OSCAR-21 08:03f 09:48F 11:40I 19:01g 20:46E 22:35I
RS-10/11 06:42i 08:27c 10:13H 20:13g 21:57E 23:49I
RS-12/13 01:43H 09:11i 10:55e 12:41G 22:41h
DOVE 03:19g 04:57E 06:42I 15:34i 17:11c 18:52H
AO-27 01:15I 02:47g 04:26F 06:13I 15:03i 16:41b 18:22H
Fri 07 Oct 94
MIR 05:15g 06:51f 08:29i 10:07i 11:43h 13:19e 14:57i
OSCAR-21 06:49i 08:30d 10:17H 17:45i 19:29e 21:15G
RS-10/11 07:12h 08:57D 10:45I 19:02i 20:42e 22:28G

RS-12/13 00:24C 02:13I 09:38h 11:23B 13:10H 23:07f
DOVE 02:51h 04:28A 06:10I 15:08I 16:42f 18:22G
AO-27 02:21h 03:59C 05:42I 14:38i 16:15d 17:55H
Sat 08 Oct 94
MIR 04:21i 05:56c 07:33h 09:11i 10:48h 12:24c 14:01i
OSCAR-21 07:14h 08:57B 10:47I 18:12h 19:56b 21:43H
RS-10/11 05:58i 07:41f 09:27G 19:29h 21:12A 23:00H
RS-12/13 00:53F 02:45I 10:06g 11:51E 13:40I 21:54i 23:35d
DOVE 02:24i 03:59e 05:39H 16:14h 17:53E 19:34I
AO-27 01:56i 03:32c 05:14H 15:48g 17:28F 19:10I
Sun 09 Oct 94
MIR 03:28i 05:01e 06:37h 08:16i 09:53i 11:29f 13:05g
OSCAR-21 07:41g 09:26F 11:18I 18:39g 20:24E 22:13I
RS-10/11 06:27i 08:11b 09:58H 19:57g 21:42E 23:34I
RS-12/13 01:22H 08:51i 10:34e 12:20G 22:20h
DOVE 01:58I 03:30g 05:09F 15:45i 17:24A 19:04I
AO-27 01:31i 03:06f 04:46G 15:22h 17:01D 18:42I
Mon 10 Oct 94
MIR 04:06g 05:42f 07:20i 08:57i 10:34h 12:10e 13:48i
OSCAR-21 06:27i 08:08d 09:54H 17:23i 19:06e 20:52G
RS-10/11 06:56g 08:42D 10:30I 18:46i 20:26d 22:13G
RS-12/13 00:03C 01:52I 09:18h 11:02B 12:49H 22:47f
DOVE 03:02h 04:40C 06:23I 15:18i 16:55e 18:35H
AO-27 02:40g 04:18E 06:04I 14:56i 16:34b 18:15H
Tue 11 Oct 94
MIR 03:12i 04:46d 06:24h 08:02i 09:39h 11:15b 12:52i
OSCAR-21 06:52h 08:35B 10:24I 17:49h 19:34a 21:21H
RS-10/11 05:43i 07:26e 09:12G 19:13h 20:56B 22:45I
RS-12/13 00:32F 02:24I 09:45g 11:31E 13:19I 21:33i 23:14c
DOVE 02:35i 04:11c 05:52H 16:26g 18:05F 19:47I
AO-27 02:14h 03:51B 05:34I 14:31i 16:07e 17:47G
Wed 12 Oct 94
MIR 02:18i 03:51e 05:28h 07:06i 08:44i 10:20f 11:56g
OSCAR-21 07:18g 09:03F 10:55I 18:17g 20:02E 21:50I
RS-10/11 06:11h 07:56b 09:43H 19:42g 21:27F 23:19I
RS-12/13 01:01H 08:30i 10:13e 11:59G 21:59h 23:42C
DOVE 02:09i 03:42f 05:22G 15:57h 17:36C 19:17I
AO-27 01:49i 03:25d 05:06H 15:41g 17:20F 19:02I
Thr 13 Oct 94
MIR 02:57g 04:33f 06:10i 07:48i 09:25g 11:01e 12:39i
OSCAR-21 06:05i 07:45d 09:32H 17:01i 18:44e 20:30G
RS-10/11 06:41g 08:26E 10:15I 18:30i 20:11d 21:58H
RS-12/13 01:32I 08:57h 10:41A 12:28H 22:26f
DOVE 03:14h 04:52E 06:37I 15:29i 17:07c 18:47H
AO-27 01:25i 02:59f 04:38G 15:15h 16:53C 18:35I
Fri 14 Oct 94
MIR 02:02i 03:37c 05:15h 06:53i 08:29h 10:06d 11:43i
OSCAR-21 06:30h 08:13B 10:02I 17:27h 19:12a 20:58H
RS-10/11 05:27i 07:11e 08:57G 18:57h 20:41C 22:30I
RS-12/13 00:11F 02:04I 09:25g 11:10E 12:59I 21:13i 22:53c

DOVE 02:46i 04:23b 06:05I 16:38f 18:17G 20:01I
AO-27 02:33h 04:11D 05:56I 14:49i 16:27c 18:07H
Sat 15 Oct 94
MIR 01:09i 02:42d 04:19h 05:57i 07:34i 09:10f 10:47h
OSCAR-21 06:56g 08:41F 10:33I 17:54g 19:39E 21:28I
RS-10/11 05:56h 07:41A 09:28H 19:26f 21:11F 23:05I
RS-12/13 00:41H 08:09i 09:52e 11:39G 21:38h 23:22C
DOVE 02:20i 03:54e 05:35G 16:09h 17:48E 19:30I
AO-27 02:07h 03:44b 05:26I 14:25I 16:00f 17:40G 19:24I
Sun 16 Oct 94
MIR 01:47g 03:23f 05:01i 06:39i 08:15g 09:51e 11:30i
OSCAR-21 05:43i 07:23d 09:10G 16:39i 18:22e 20:07G
RS-10/11 06:25g 08:11E 10:00I 18:14i 19:55c 21:43H
RS-12/13 01:11I 08:36h 10:21A 12:08H 22:05f 23:50F
DOVE 03:26g 05:05F 06:51I 15:41i 17:19a 18:59H
AO-27 01:42i 03:18e 04:58H 15:34g 17:13E 18:55I
Mon 17 Oct 94
MIR 00:53h 02:28d 04:05h 05:43i 07:20h 08:56b 10:33i 23:59i
OSCAR-21 06:08h 07:50B 09:39I 17:05i 18:49b 20:36H
RS-10/11 05:11i 06:55d 08:41G 18:42h 20:25C 22:15I
RS-12/13 01:43I 09:04g 10:49E 12:38I 20:52i 22:33c
DOVE 02:58h 04:35C 06:18I 15:14i 16:50e 18:30G
AO-27 01:19i 02:52g 04:31F 15:08h 16:46B 18:27I
Tue 18 Oct 94
MIR 01:33e 03:09h 04:47i 06:25i 08:01f 09:37h
OSCAR-21 06:34g 08:18E 10:10I 17:32g 19:17D 21:05I
RS-10/11 05:40h 07:25B 09:12I 17:33i 19:10f 20:56F 22:50I
RS-12/13 00:20H 07:48i 09:32e 11:18G 21:18h 23:01C
DOVE 02:31i 04:06d 05:47H 16:21g 18:00F 19:42I
AO-27 02:26h 04:04C 05:47I 14:42i 16:19d 18:00H
Wed 19 Oct 94
MIR 00:38g 02:14g 03:52i 05:29i 07:06g 08:42e 10:20i 23:43h
OSCAR-21 05:21i 07:01d 08:47G 16:16i 17:59f 19:45G
RS-10/11 04:29I 06:10g 07:55F 09:45I 17:58i 19:40b 21:28H
RS-12/13 00:50I 08:15h 10:00A 11:47H 21:44f 23:30F
DOVE 02:05i 03:38f 05:17G 15:53h 17:31C 19:12I
AO-27 02:00i 03:37b 05:19H 15:53f 17:33G 19:16I
Thr 20 Oct 94
MIR 01:18c 02:56h 04:34i 06:10h 07:47d 09:24i 22:49i
OSCAR-21 05:45h 07:28B 09:17H 16:42i 18:27b 20:13H
RS-10/11 04:56i 06:40d 08:26H 18:26h 20:10D 22:00I
RS-12/13 01:22I 08:43g 10:28E 12:17I 20:31i 22:12d 23:59H
DOVE 03:10h 04:48D 06:31I 15:25i 17:02d 18:42H
AO-27 01:36i 03:11e 04:51G 15:27h 17:06D 18:47I
Fri 21 Oct 94
MIR 00:23d 02:00h 03:38i 05:15h 06:51f 08:28h 23:28g
OSCAR-21 06:11g 07:56E 09:48I 17:09h 18:55D 20:43I
RS-10/11 05:25h 07:10B 08:57I 17:17i 18:55f 20:41G 22:37I
RS-12/13 07:28i 09:11e 10:57G 20:57h 22:40C
DOVE 02:42i 04:19b 06:00H 16:33g 18:13G 19:56I

AO-27 02:44g 04:23F 06:10I 15:01i 16:39a 18:20H
Sat 22 Oct 94
MIR 01:04f 02:42i 04:20i 05:56g 07:32e 09:11i 22:34h
OSCAR-21 04:59i 06:38e 08:25G 15:54i 17:37f 19:23G
RS-10/11 04:12i 05:54f 07:40F 09:31I 17:43i 19:24b 21:13H
RS-12/13 00:29I 07:54h 09:39B 11:26H 21:24f 23:09F
DOVE 02:15i 03:50f 05:30G 16:05h 17:43D 19:25I
AO-27 02:19h 03:56C 05:40I 14:36i 16:12e 17:52H
Sun 23 Oct 94
MIR 00:09d 01:46h 03:24i 05:01h 06:37b 08:14i 21:40i 23:13d
OSCAR-21 05:23h 07:06A 08:54H 16:20i 18:04b 19:51H
RS-10/11 04:40i 06:24c 08:11H 18:10g 19:55D 21:45I
RS-12/13 01:01I 08:22g 10:07E 11:56I 20:10i 21:51d 23:38H
DOVE 03:22g 05:00E 06:45I 15:37i 17:14b 18:55H
AO-27 01:54i 03:30c 05:11H 15:46g 17:25F 19:08I
Mon 24 Oct 94
MIR 00:50h 02:28i 04:05i 05:42f 07:18h 22:18g 23:54g
OSCAR-21 05:49g 07:34E 09:25I 16:47h 18:32D 20:20I
RS-10/11 05:09h 06:54C 08:42I 17:00i 18:39e 20:26G
RS-12/13 07:07i 08:50e 10:36G 20:36h 22:19C
DOVE 02:54h 04:31A 06:13I 15:10i 16:45f 18:25G
AO-27 01:29i 03:03f 04:43G 15:19h 16:58D 18:40I
Tue 25 Oct 94
MIR 01:32i 03:10i 04:46g 06:23f 08:01i 21:24h 22:59d
OSCAR-21 04:36i 06:16e 08:02G 15:32i 17:14f 19:00G
RS-10/11 03:56i 05:39f 07:25F 17:27h 19:09b 20:57H
RS-12/13 00:09I 07:34h 09:18b 11:05H 21:03f 22:48F
DOVE 02:27i 04:02d 05:42H 16:17g 17:56E 19:37I
AO-27 02:37g 04:16E 06:01I 14:54i 16:32b 18:12H
Wed 26 Oct 94
MIR 00:36h 02:14i 03:51h 05:27a 07:04i 20:30i 22:03d 23:40h
OSCAR-21 05:01h 06:43A 08:32H 15:58i 17:42b 19:28H
RS-10/11 04:24i 06:09c 07:55H 17:55g 19:39E 21:31I
RS-12/13 00:41I 08:01g 09:47E 11:35I 19:50i 21:30d 23:17H
DOVE 02:01i 03:33g 05:13F 15:48i 17:27B 19:07I
AO-27 02:12h 03:49B 05:32I 14:29i 16:05e 17:45G
Thr 27 Oct 94
MIR 01:18i 02:56h 04:32f 06:08h 21:08g 22:45g
OSCAR-21 05:27g 07:11E 09:02I 16:25h 18:10D 19:58I
RS-10/11 04:54h 06:39D 08:27I 16:44i 18:24e 20:10G
RS-12/13 06:46i 08:29e 10:15G 20:15h 21:58B 23:48I
DOVE 03:05h 04:43C 06:26I 15:21i 16:58d 18:38H
AO-27 01:47i 03:23d 05:03H 15:39g 17:18F 19:00I
Fri 28 Oct 94
MIR 00:22i 02:00i 03:37g 05:13f 06:51i 20:14h 21:49d 23:26h
OSCAR-21 04:14i 05:54e 07:40G 15:10i 16:52f 18:38G
RS-10/11 03:40i 05:23f 07:09G 17:11h 18:54A 20:42H
RS-12/13 07:13h 08:57A 10:44H 20:42f 22:27F
DOVE 02:38i 04:14c 05:55H 16:29g 18:08F 19:51I
AO-27 01:23i 02:56f 04:36G 15:12h 16:51C 18:32I

Sat 29 Oct 94
MIR 01:04i 02:41h 04:17b 05:54i 19:20i 20:54d 22:30h
OSCAR-21 04:39h 06:21A 08:09H 15:35i 17:20c 19:06H
RS-10/11 04:09i 05:53b 07:40H 17:39g 19:24E 21:16I
RS-12/13 00:20I 07:40g 09:26E 11:14I 19:29i 21:10d 22:57H
DOVE 02:11i 03:45f 05:25G 16:00h 17:39C 19:20I
AO-27 02:30h 04:09D 05:53I 14:47i 16:24c 18:05H
Sun 30 Oct 94
MIR 00:09i 01:46h 03:22f 04:58h 19:59g 21:35g 23:13i
OSCAR-21 05:05g 06:49E 08:40I 16:02h 17:47C 19:35I
RS-10/11 04:38g 06:24D 08:12I 16:28i 18:08d 19:55G
RS-12/13 06:25i 08:08e 09:54G 19:55h 21:38B 23:27I
DOVE 03:17h 04:55E 06:40I 15:32i 17:10c 18:50H
AO-27 02:05i 03:42a 05:24I 15:58f 17:38G 19:21I
Mon 31 Oct 94
MIR 00:50i 02:27g 04:03f 05:41i 19:04h 20:39d 22:17h 23:55i
OSCAR-21 03:52i 05:31e 07:17G 14:47i 16:30f 18:15F
RS-10/11 03:25i 05:08e 06:54G 16:55h 18:38B 20:27I
RS-12/13 06:52h 08:37A 10:24H 20:21g 22:06F 23:59I
DOVE 02:49h 04:26b 06:08I 15:07I 16:41f 18:20G 20:05I
AO-27 01:40i 03:15e 04:56H 15:31h 17:11E 18:52I
Tue 01 Nov 94
MIR 01:31h 03:07b 04:44i 18:10i 19:44d 21:20h 22:59i
OSCAR-21 04:17i 05:59a 07:47H 15:13i 16:57c 18:44H
RS-10/11 03:53h 05:38b 07:25H 17:24g 19:09F 21:01I
RS-12/13 07:20g 09:05E 10:54I 19:08i 20:49d 22:36H
DOVE 02:22i 03:57e 05:38H 16:12h 17:51E 19:33I
AO-27 01:17I 02:49g 04:28F 15:05i 16:44A 18:25I

1624. EZSATS Western Pass Times 10/03-11/01

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 09:30:51 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <36trob$mat@usenet.INS.CWRU.Edu>
Source record: 26726

Please don't post this file to packet. It contains four weeks worth of
pass times for the Western half of the US and it's too long for packet.

Easy Sats West - Western US Satellite UTC Pass Times de N9LTD

Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 30Sep
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 27Sep
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 25Sep
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DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 24Sep
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 24Sep

Mon 03 Oct 94
MIR 07:19i 08:52d 10:29h 12:07i 13:44h 15:20d 16:57h
OSCAR-21 00:14I 08:30i 10:10d 11:57G 19:24i 21:08e 22:54G
RS-10/11 01:18I 08:42h 10:27B 12:14I 20:35i 22:13f 23:59F
RS-12/13 00:19h 02:02B 03:51H 11:16h 13:00b 14:47H
DOVE 03:14i 04:47g 06:26F 08:13I 17:01i 18:39b 20:20H
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Tue 04 Oct 94
MIR 07:57g 09:34f 11:11h 12:49h 14:25f 16:01g
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RS-10/11 01:52I 07:29i 09:12f 10:57F 12:47I 21:01i 22:43b
RS-12/13 00:46g 02:31E 04:22I 11:43g 13:29E 15:17I 23:33i
DOVE 04:19h 05:56C 07:39I 16:33i 18:10e 19:50G
AO-27 03:42h 05:20D 07:04I 15:58i 17:35d 19:15H
Wed 05 Oct 94
MIR 07:03h 08:38c 10:16h 11:53i 13:30h 15:06d 16:44i
OSCAR-21 09:21g 11:06E 12:57I 20:18g 22:03D 23:51I
RS-10/11 00:30H 07:57i 09:41c 11:28H 21:29g 23:13D
RS-12/13 01:13d 03:00G 10:28i 12:11e 13:57G 23:58h
DOVE 03:51i 05:27c 07:09H 17:41g 19:21F 21:02I
AO-27 03:17i 04:54b 06:35H 17:09g 18:48F 20:31I
Thr 06 Oct 94
MIR 06:09i 07:43d 09:20h 10:58i 12:35h 14:11c 15:48h
OSCAR-21 08:08i 09:48d 11:34G 19:02i 20:45e 22:31G
RS-10/11 01:03I 08:26h 10:12C 11:59I 20:18i 21:58e 23:44G
RS-12/13 01:41B 03:30H 10:55h 12:39a 14:26H
DOVE 03:24i 04:59f 06:38G 17:13h 18:51C 20:32I
AO-27 02:52i 04:27e 06:08G 16:42h 18:21D 20:03I
Fri 07 Oct 94
MIR 06:48g 08:24f 10:02h 11:40h 13:16f 14:52g
OSCAR-21 08:32h 10:15B 12:04H 19:29h 21:13b 23:00H
RS-10/11 01:38I 07:13i 08:56f 10:42F 12:32I 20:45h 22:27b

RS-12/13 00:25g 02:10E 04:01I 11:22g 13:08D 14:56I 23:12i
DOVE 04:30h 06:09D 07:53I 16:45i 18:22d 20:02H
AO-27 02:28i 04:01g 05:40F 07:26I 16:16i 17:55a 19:35H
Sat 08 Oct 94
MIR 05:54h 07:29c 09:06h 10:44i 12:21h 13:57d 15:35i
OSCAR-21 08:59g 10:43E 12:34I 19:56g 21:41D 23:29I
RS-10/11 00:15H 07:42i 09:26c 11:13H 21:13g 22:57E
RS-12/13 00:52d 02:39G 10:07i 11:50e 13:36G 23:37h
DOVE 04:03h 05:40b 07:21H 17:53f 19:33G 21:15I
AO-27 03:35h 05:13C 06:56I 15:51i 17:28e 19:08G
Sun 09 Oct 94
MIR 05:00i 06:34d 08:11h 09:49i 11:26h 13:02c 14:39h
OSCAR-21 07:45i 09:25e 11:12G 18:40i 20:23f 22:09G
RS-10/11 00:48I 08:11h 09:56D 11:44I 20:02i 21:42e 23:28G
RS-12/13 01:20B 03:09H 10:34h 12:19a 14:05H
DOVE 03:36i 05:11e 06:51G 17:25h 19:04D 20:45I
AO-27 03:10i 04:46c 06:28H 17:02g 18:41F 20:23I
Mon 10 Oct 94
MIR 05:39g 07:15f 08:53h 10:30h 12:07f 13:43g
OSCAR-21 08:10h 09:53A 11:41H 19:06i 20:51b 22:37H
RS-10/11 06:57i 08:41f 10:27G 20:29h 22:12A
RS-12/13 00:04g 01:49E 03:40I 11:02g 12:47D 14:35I 22:51i
DOVE 03:10i 04:42g 06:21F 08:07I 16:56i 18:35b 20:15H
AO-27 02:45i 04:20f 06:00G 16:35h 18:14C 19:55I
Tue 11 Oct 94
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OSCAR-21 08:36g 10:21E 12:12I 19:33g 21:19D 23:06I
RS-10/11 00:00H 07:26i 09:11b 10:57H 20:57g 22:42E
RS-12/13 00:32d 02:18G 09:46i 11:30e 13:16G 23:17h
DOVE 04:14h 05:52B 07:34I 16:29i 18:06e 19:45G
AO-27 03:54g 05:33E 07:18I 16:09i 17:47c 19:28H
Wed 12 Oct 94
MIR 03:51i 05:25d 07:02h 08:39i 10:16h 11:53d 13:29h
OSCAR-21 07:23i 09:03e 10:49G 18:18i 20:01f 21:47G
RS-10/11 00:33I 07:55g 09:41D 11:29I 19:46i 21:27d 23:13G
RS-12/13 01:00B 02:48H 10:13h 11:58a 13:45H 23:43g
DOVE 03:47i 05:23d 07:04H 17:37g 19:16E 20:58I
AO-27 03:28h 05:06A 06:48I 15:45i 17:21f 19:01G 20:44I
Thr 13 Oct 94
MIR 02:59i 04:30g 06:06g 07:44h 09:21h 10:57f 12:34g
OSCAR-21 07:48h 09:30A 11:19H 18:44i 20:28b 22:15H
RS-10/11 06:42i 08:25e 10:11G 20:13h 21:56B 23:45H
RS-12/13 01:28E 03:20I 10:41g 12:26D 14:14I 22:30i
DOVE 03:20i 04:54f 06:34G 17:08h 18:47B 20:27I
AO-27 03:03i 04:39d 06:20H 16:54g 18:34E 20:15I
Fri 14 Oct 94
MIR 03:35h 05:11d 06:48h 08:26i 10:02g 11:38e 13:16i
OSCAR-21 08:14g 09:58E 11:49I 19:11h 20:56D 22:44I
RS-10/11 07:10h 08:55b 10:42H 20:42g 22:27E
RS-12/13 00:11d 01:57G 09:25i 11:09e 12:55G 22:56h

DOVE 04:26h 06:04D 07:48I 16:41i 18:18d 19:58H
AO-27 02:39i 04:13f 05:53G 16:28h 18:07B 19:48I
Sat 15 Oct 94
MIR 02:41i 04:15c 05:52h 07:30i 09:07h 10:43c 12:20h
OSCAR-21 07:01i 08:41e 10:27G 17:55i 19:38f 21:24G
RS-10/11 00:18I 07:40g 09:25E 11:14I 19:30i 21:11d 22:58G
RS-12/13 00:39B 02:27H 09:52h 11:37b 13:24H 23:23g
DOVE 03:58i 05:35b 07:17H 17:49g 19:28F 21:10I
AO-27 03:47h 05:25D 07:09I 16:03i 17:40d 19:20H
Sun 16 Oct 94
MIR 01:49i 03:20g 04:57g 06:34h 08:12h 09:48f 11:24g
OSCAR-21 07:26h 09:08b 10:56H 18:22i 20:06b 21:52H
RS-10/11 06:26i 08:10e 09:56G 19:58h 21:41B 23:30I
RS-12/13 01:07E 02:59I 10:20g 12:05E 13:53I 22:10i 23:50d
DOVE 03:31i 05:06e 06:46G 17:20h 18:59D 20:40I
AO-27 03:22h 04:59a 06:41H 17:14f 18:53G 20:36I
Mon 17 Oct 94
MIR 02:26h 04:01d 05:39h 07:16i 08:53g 10:29d 12:07i
OSCAR-21 07:52g 09:36E 11:27I 18:49h 20:34D 22:21I
RS-10/11 06:55h 08:40A 10:27H 20:26f 22:11F
RS-12/13 01:37G 09:05i 10:48e 12:34G 22:35h
DOVE 04:38g 06:16E 08:02I 16:52i 18:30b 20:10H
AO-27 02:57i 04:32e 06:13H 16:47h 18:26E 20:08I
Tue 18 Oct 94
MIR 01:32i 03:06c 04:43h 06:21i 07:58h 09:34c 11:11h
OSCAR-21 06:39i 08:18e 10:05G 17:33i 19:16f 21:02F
RS-10/11 00:04I 05:44I 07:24g 09:10E 10:59I 19:14i 20:56c 22:43H
RS-12/13 00:18B 02:07H 09:32h 11:16b 13:03H 23:02g
DOVE 04:10h 05:47B 07:30I 16:26i 18:01f 19:41G 21:24I
AO-27 02:33i 04:06g 05:45F 07:32I 16:21i 18:00A 19:40H
Wed 19 Oct 94
MIR 00:39i 02:11g 03:47g 05:25h 07:02h 08:38f 10:15g
OSCAR-21 07:04h 08:46a 10:34H 17:59i 19:44c 21:30H
RS-10/11 06:10i 07:54d 09:41G 19:42h 21:26C 23:15I
RS-12/13 00:47E 02:38I 09:59g 11:45D 13:33I 21:49i 23:29d
DOVE 03:43i 05:18d 06:59H 17:32h 19:11E 20:53I
AO-27 03:40h 05:18C 07:02I 15:56i 17:33d 19:13H
Thr 20 Oct 94
MIR 01:16h 02:52e 04:29h 06:07i 07:43g 09:19e 10:57i
OSCAR-21 07:29g 09:14E 11:04I 18:26h 20:11C 21:59I
RS-10/11 06:39h 08:24A 10:11H 18:33i 20:11f 21:56F 23:49I
RS-12/13 01:16G 08:44i 10:27e 12:13G 22:14h 23:57B
DOVE 03:16i 04:50g 06:29F 17:04i 18:42B 20:23H
AO-27 03:15i 04:51c 06:33H 17:06g 18:46F 20:28I
Fri 21 Oct 94
MIR 00:22i 01:56c 03:33h 05:11i 06:48h 08:24b 10:01h 23:29i
OSCAR-21 06:17i 07:56e 09:42G 17:11i 18:54f 20:39F
RS-10/11 05:27i 07:09g 08:55E 10:44I 18:59i 20:40c 22:28H
RS-12/13 01:46H 09:11h 10:55a 12:42H 22:41g
DOVE 04:22h 05:59D 07:43I 16:36i 18:13e 19:53H

AO-27 02:50i 04:25e 06:05G 16:40h 18:19D 20:00I
Sat 22 Oct 94
MIR 01:01f 02:37g 04:15h 05:53h 07:29f 09:05g
OSCAR-21 06:41h 08:23a 10:11H 17:37i 19:21c 21:08H
RS-10/11 05:55i 07:39d 09:25G 19:26h 21:10D 23:00I
RS-12/13 00:26E 02:17I 09:38g 11:24D 13:12I 21:28i 23:08d
DOVE 03:54i 05:30c 07:12H 17:44g 19:24F 21:06I
AO-27 02:27I 03:59g 05:38E 07:23I 16:14i 17:52b 19:33H
Sun 23 Oct 94
MIR 00:07h 01:42d 03:19h 04:57i 06:34g 08:10e 09:48i 23:12i
OSCAR-21 07:07g 08:51E 10:42I 18:04h 19:49C 21:36I
RS-10/11 06:24h 08:09B 09:56I 18:17i 19:55f 21:41F 23:34I
RS-12/13 00:55G 08:23i 10:06e 11:52G 21:54h 23:36A
DOVE 03:27i 05:02f 06:41G 17:16h 18:54C 20:35I
AO-27 03:33h 05:11B 06:54I 15:49i 17:26e 19:06G
Mon 24 Oct 94
MIR 00:47d 02:24h 04:01i 05:38h 07:14c 08:51i 22:20i 23:51f
OSCAR-21 05:55i 07:34e 09:20G 11:15I 16:49i 18:31f 20:17F 22:07I
RS-10/11 05:11i 06:54f 08:39F 10:29I 18:43i 20:25b 22:12H
RS-12/13 01:25H 08:50h 10:35a 12:21H 22:20g
DOVE 04:33g 06:12E 07:56I 16:48i 18:25c 20:06H
AO-27 03:08i 04:44c 06:25H 16:59g 18:39F 20:21I
Tue 25 Oct 94
MIR 01:28g 03:06h 04:43h 06:19f 07:56g 22:57h
OSCAR-21 06:19i 08:01b 09:49H 17:15i 18:59c 20:45H
RS-10/11 05:39i 07:23c 09:10H 19:11g 20:55D 22:45I
RS-12/13 00:05E 01:56I 09:18g 11:03D 12:51I 21:07i 22:48d
DOVE 04:06h 05:43A 07:25I 16:22I 17:56f 19:36G 21:19I
AO-27 02:43i 04:18f 05:58G 16:33h 18:12C 19:53I
Wed 26 Oct 94
MIR 00:32d 02:10h 03:47i 05:24g 07:00e 08:38i 22:03i 23:37c
OSCAR-21 06:45g 08:29D 10:19I 17:42h 19:27C 21:14I
RS-10/11 06:08h 07:54C 09:41I 18:01i 19:40e 21:26G 23:20I
RS-12/13 00:34G 08:02i 09:46e 11:32G 21:33h 23:16A
DOVE 03:38i 05:14e 06:54H 17:28h 19:07E 20:48I
AO-27 03:52g 05:30E 07:15I 16:07i 17:45c 19:25H
Thr 27 Oct 94
MIR 01:14h 02:52i 04:28h 06:05c 07:42i 21:10i 22:42f
OSCAR-21 05:33i 07:12f 08:57G 10:52I 16:26i 18:09f 19:55F 21:45I
RS-10/11 04:55i 06:38f 08:24F 10:14I 18:27h 20:09b 21:57H
RS-12/13 01:04H 08:29h 10:14a 12:00H 22:00g 23:44E
DOVE 03:12i 04:45g 06:24F 08:11I 16:59i 18:38b 20:18H
AO-27 03:26h 05:03B 06:46I 15:43i 17:18f 18:58G 20:41I
Fri 28 Oct 94
MIR 00:18g 01:56h 03:33h 05:09f 06:46g 21:47h 23:22e
OSCAR-21 05:57i 07:39b 09:27H 16:52i 18:36c 20:23H
RS-10/11 05:24i 07:08c 08:55H 18:55g 20:39E 22:30I
RS-12/13 01:36I 08:57g 10:42D 12:30I 20:47i 22:27d
DOVE 04:17h 05:55C 07:38I 16:32i 18:09e 19:48G
AO-27 03:01i 04:37d 06:18H 16:52g 18:31E 20:13I

Sat 29 Oct 94
MIR 01:00h 02:37i 04:14g 05:50e 07:28i 20:53i 22:27b
OSCAR-21 06:23g 08:07D 09:57I 17:19h 19:04C 20:51I
RS-10/11 05:53h 07:38C 09:26I 17:44i 19:24e 21:10G
RS-12/13 00:14G 07:41i 09:25e 11:11G 11:28G 21:12h 22:55B
DOVE 03:50i 05:26c 07:07H 17:40g 19:19F 21:01I
AO-27 02:37i 04:11f 05:50F 16:26h 18:05B 19:45I
Sun 30 Oct 94
MIR 00:04h 01:42i 03:19h 04:55c 06:32i 20:00i 21:32f 23:08g
OSCAR-21 05:11i 06:49f 08:35G 10:29I 16:04i 17:47f 19:32F 21:22I
RS-10/11 04:39i 06:23f 08:09F 18:11h 19:54A 21:42H
RS-12/13 00:44H 08:08h 09:53b 11:40H 21:39g 23:24E
DOVE 03:23i 04:57f 06:37G 17:11h 18:50B 20:31I
AO-27 03:45h 05:23D 07:07I 16:00i 17:38d 19:18H
Mon 31 Oct 94
MIR 00:46h 02:23h 03:59f 05:36g 20:37h 22:12e 23:50h
OSCAR-21 05:35i 07:16b 09:04H 16:30i 18:14d 20:00H
RS-10/11 05:08i 06:53b 08:39H 18:39g 20:24E 22:15I
RS-12/13 01:15I 08:36g 10:21D 12:09I 20:26i 22:06d 23:53G
DOVE 04:29h 06:07D 07:51I 16:43i 18:21d 20:01H
AO-27 03:19h 04:56b 06:38H 17:11f 18:51G 20:33I
Tue 01 Nov 94
MIR 01:27i 03:04g 04:40e 06:18i 19:43i 21:17b 22:54h
OSCAR-21 06:00h 07:44D 09:34I 16:57h 18:42B 20:29I
RS-10/11 05:37g 07:23D 09:11I 17:28i 19:09e 20:55G
RS-12/13 07:21i 09:04e 10:50G 20:51h 22:34B
DOVE 04:01i 05:38a 07:20H 17:52f 19:31G 21:14I
AO-27 02:54i 04:30e 06:10G 16:45h 18:24D 20:05I

1625. Re: AEA DSP-1232 problem

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 16:18:56 UTC
From: n4hy@tang.ccr-p.ida.org
Message-ID: <N4HY.94Oct5161856@tang.ccr-p.ida.org>
Source record: 26729

It depends on what your radio is as to how it functions. What type of
radio are you using?

Bob
--
Robert W. McGwier | n4hy@ccr-p.ida.org: ham radio, scouts,
Center for Communications Research | astronomy, golf (o yea, & math!) ASM
Princeton, N.J. 08520 | Troop 5700, ACM Pack 53, Sanhican #2 WWW,
(609)-279-6240(v) (609)-924-3061(f)| District and Council Activities Chair.
(609-443-8963 (h) | I used to be a Buffalo . . . NE III-120

1626. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-05 20:58:36 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.781390716@dolphin>
Source record: 26732

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 68
1 23285U 94062A 94278.25000000 .00017854 11078-4 94937-5 0 217
2 23285 56.9935 55.1049 0009228 289.8889 264.8358 16.21571730 779
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1627. STS-68 Orbital State Vector Rev #86

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 00:12:36 UTC
From: astroman@netcom.com
Message-ID: <astromanCx85x1.3tq@netcom.com>
Source record: 26730
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94278.75119126157
10/05/1994 18:01:42.925 UTC
EFG E: 14491890.36 ft
F: -1657543.32 ft
G: -15977461.41 ft
Edot: -8805.9132 ft/s
Fdot: 20677.9233 ft/s
Gdot: -10113.7721 ft/s
ndot/2 (drag): 0.00151030585 rev/day^2
nddt/6: 9.37593E-08 rev/day^3
Bstar: 6.60003E-05 1/Earth Radii
Elset #: 12
Rev @ Epoch: 86.67165994063

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1628. SATTRACK V2.0 FOR UNIX/LINUX AVAILABLE NOW

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 03:33:17 UTC
From: manfred@sunspot.ssl.berkeley.edu
Message-ID: <36vr5t$ds5@agate.berkeley.edu>
Source record: 26731
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,sci.geo.satellite-nav,rec.video.satellite.tvro

SatTrack V2.0 Release

Finally version 2.0 of SatTrack is ready to be released. This new version features the NOARD SGP4 propagation model, a live display for a single satellite as well as a live display for multiple satellites (as many as the computing power of the machine it runs on allows), a batch mode with arguments passed on the command line, and the orbit prediction capabilities that V1.7 had. Numerous suggestions from users of V1.7 all over the world have been incorporated in the new version, like tracking of the Sun and the Moon for system tests and EME, respectively, the calculation of off-pointing (squint) angles, and also some subroutines that allow control of ground station equipment (radios and antenna controllers). The framework for the latter is provided in a way that allows the user to easily make changes for a particular application. The program will run on Sun workstations and Linux i386 laptop computers (see documentaion file).

Future releases are expected to feature the SDP4 model for satellites with a period of more than 225 minutes (V2.1) and Xwindows graphics (V3.0).

Bob Kupiec was kind enough to provide an FTP site from which SatTrack can be obtained. Do the following:

ftp ftp.jvnc.net (128.121.50.2)
login anonymous
cd /priv/kupiec/incoming (or later: cd /priv/kupiec/sattrack)
get sattrack.V2.0.tar.Z

Place this file into your Unix home directory, uncompress it, and then type 'tar xvpf sattrack.V2.0.tar'. This will unbundle the distribution file and will create all necessary sub-directories. Then look into the documentation file 'sattrack.doc' in SatTrack/doc for instructions how to compile sattrack (and some other auxiliary programs). It should compile perfectly on at least Sun-3's (SunOS 4.0.3), SPARCstation IPCs (SunOS 4.1.1) and i386 laptops running Linux. Make sure the compiler and linker flags in the Makefile are configured properly!

Please let me know how the installation went and if you encountered any problems, bugs or imperfections.

Manfred Bester

Space Sciences Laboratory
University of California
Berkeley, CA 94720, USA
(510) 642-8497
manfred@ssl.berkeley.edu

1629. SATTRACK V2.0 CORRECTION

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 05:46:32 UTC
From: manfred@sunspot.ssl.berkeley.edu
Message-ID: <3702vo$gua@agate.berkeley.edu>
Source record: 26733
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,sci.geo.satellite-nav,rec.video.satellite.tvro

SatTrack V2.0 Release Correction

Oops, I forgot to set the mode to binary when transferring the compressed
distribution file to ftp.jvnc.net. Since I can't wipe out the corrupted
file, I posted another one with a slightly different name (see below).
To get this one, do:

ftp ftp.jvnc.net (128.121.50.2)
login anonymous
binary
cd /priv/kupiec/incoming (or later: cd /priv/kupiec/sattrack)
get sattrack.V2.0.tar.dist.Z

Place this file into your Unix home directory, uncompress it, and then
type 'tar xvpf sattrack.V2.0.tar.dist'. This will unbundle the distribution
file and will create all necessary sub-directories. Then look into the
documentation file 'sattrack.doc' in SatTrack/doc for instructions how to
compile sattrack (and some other auxiliary programs).

Sorry for the inconvenience. My fault.

Manfred Bester

1630. Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 12:54:47 UTC
From: dmgillah@mtu.EDU
Message-ID: <199410061254.IAA08120@mtu.edu>
Source record: 26734

Howdy! I was womdering if any of you know where I can find updates of
the phase schedule for varies satellites. Example: AO-13 Phase 1-180:mode B
Phase 180-256:mode J

That was the last update I have as of 20APR94, I'd like to get something
more recent. Thanks!
--
****
* Talk to ya, Dave Attention all Skydivers: *
* Until you've jumped *
* Michigan Technological University into pitch blackness *
* Where it's too &@#% cold! at 1250 feet with 80 *
* dmgillah@mtu.edu pounds of combat gear, *
* kb8por@w8yy.#upmi.mi.usa.na YOUR STILL A LEG !!! *
****

1631. Re: SATTRACK V2.0 CORRECTION

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 13:45:14 UTC
From: kupiec@tigger.jvnc.net
Message-ID: <1994Oct6.134514.6013@tigger.jvnc.net>
Source record: 26735
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,sci.geo.satellite-nav,rec.video.satellite.tvro

In <3702vo$gua@agate.berkeley.edu>, manfred@sunspot.ssl.berkeley.edu writes:
>SatTrack V2.0 Release Correction
>
>Place this file into your Unix home directory, uncompress it, and then
>type 'tar xvpf sattrack.V2.0.tar.dist'. This will unbundle the distribution
>file and will create all necessary sub-directories. Then look into the
>documentation file 'sattrack.doc' in SatTrack/doc for instructions how to
>compile sattrack (and some other auxiliary programs).

Sattrack has moved to its new home in the sattrack directory. The
following commmands should get you a copy.

ftp ftp.jvnc.net (128.121.50.2)
login anonymous
binary
cd /priv/kupiec/sattrack
get sattrack.V2.0.tar.Z

--
Bob Kupiec (N3MML) Phone: 1-609-897-7300 JvNCnet (GES, Inc.)
Network Engineering -or- : 1-800-35-TIGER 3 Independence Way
Email: kupiec@jvnc.net Fax : 1-609-897-7310 Princeton, NJ 08540

1632. Tracking models ?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 13:51:11 UTC
From: dpalik@violet.ccit.arizona.edu
Message-ID: <1994Oct6.065111.1@violet.ccit.arizona.edu>
Source record: 26736

What is the difference between the Tracking models (SGP4 propagation model, and the others) ??

Is one more accurate ?

Do they all require the same data from TLE sets ?

Don Palik
dpalik@ccit.arizona.edu

1633. STS-68 Orbital State Vector Rev #98

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 14:44:49 UTC
From: astroman@netcom.com
Message-ID: <astromanCx9AAp.9tv@netcom.com>
Source record: 26740
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 117
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94279.50109627315
10/06/1994 12:01:34.718 UTC
EFG E: -15067070.27 ft
F: 1966417.34 ft
G: -15386667.43 ft
Edot: -13778.6437 ft/s
Fdot: -17033.2724 ft/s
Gdot: 11317.5220 ft/s
ndot/2 (drag): 0.00152346693 rev/day^2
nddt/6: 9.53824E-08 rev/day^3
Bstar: 6.49608E-05 1/Earth Radii
Elset #: 13
Rev @ Epoch: 98.83874955378

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1634. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 18:27:06 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.781468026@dolphin>
Source record: 26737

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 68
1 23285U 94062A 94279.25000000 .00019419 11087-4 98844-5 0 252
2 23285 56.9933 50.2696 0009495 295.0239 340.2033 16.21944242 934
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1635. Re: Satellite Tracking for Windoze

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 21:19:44 UTC
From: ab5sm@netcom.com
Message-ID: <ab5smCx9sKw.IuG@netcom.com>
Source record: 26738

Russ Renaud (ae517@FreeNet.Carleton.CA) wrote:

: Hope this isn't already in a FAQ, but what shareware is available to try
: for satellite tracking in the Windows world, and where could one FTP it?

: any hints would be appreciated.

: de va3rr/aa8lu
: ae517@freenet.carleton.ca
: or
: renaudr@tc.gc.ca

ftp.iea.com /pub/borg/hdn/hamsat

--

lee - ab5sm Ham Distribution Net ab5sm@netcom.com
P.O. Box 50003 ab5sm@uscourts.gov
Dallas, Tx 75250-0003

Ham Distribution Net BBS - (214) 226-1181 - Login: Guest;guest

--

1636. RE: Tracking models ?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-06 22:50:34 UTC
From: srghsjm@grv.grace.cri.nz
Message-ID: <371vjs$r5k@zephyr.grace.cri.nz>
Source record: 26739

In Article <1994Oct6.065111.1@violet.ccit.arizona.edu>
dpalik@violet.ccit.arizona.edu writes:
>What is the difference between the Tracking models (SGP4 propagation model, and
>the others) ??

For various reasons (including computational simplicity) the complicated
models that were historically developed have been simplified and refined
to models such as SGP4. By doing so, some new parameters have had to be
added to the basic element sets. The other most common prediction model
around seems to be the TBUS predictor that uses (as expected) some TBUS
elements.

>
>Is one more accurate ?
>

That's actually a more difficult question to answer than it seems. The
accuracy can be required for either short term or long term periods.
For all practical purposes, with the range of element sets that are
available over Internet, all models are pretty good (or, equally bad,
depending on your point of view).

>Do they all require the same data from TLE sets ?
>

No. The SGP4 predictor uses NASA 2-line elements that are designed
for SGP4. The NASA 2-line element format allows for SGP8, but I don't
think that was used (correct me if I'm wrong). SGP8 requires some
extra parameters. The TBUS predictor (used often in earth resources
satellites and for many low earth orbit ground stations) uses parameters
from TBUS element sets. Don't use TBUS elements in the SGP4 model, or
the reverse.

The W3IWI predictor model (a la "Orbit" circa 1986 or something like that)
is simplified model that, while cutting a few corners, takes a fairly
practical line in doing so.

Source code for SGP4 and TBUS predictors is available (albeit in FORTRAN),
but various people have converted these to Pascal and C. The results
are variously readable code...

Stephen ZL4HG

+---+
| Stephen McNeill Phone : +64-4-569 0180 |
| Image Processing Team Direct : +64-4-569 0183 |
| Landcare Research New Zealand Ltd FAX : +64-4-569 0181 |

| Box 38-491 Internet: srghsjm@gih.grace.cri.nz |
| Wellington Mail Centre Omnet : s.mcneill |
| New Zealand Packet : zl4hg @ zl4hg.wlg.nzl.oc |
+---+

1637. Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 12:00:48 UTC
From: art_jeyes@jhuapl.edu
Message-ID: <art_jeyes.1131918888A@128.220.101.100>
Source record: 26745

Hi.... I am new to rec.radio.amateur.space and am just thinking about
getting active in Sat comms....

Could someone explain the phase schedules I have seen for some of the sat
modes .... (I understand the modes Mode B, S etc) just not the phasing..

for example ... what does MA 20 to MA 50 mean ...

Thanks... Art Jeyes
AA3GU
Art.Jeyes@jhuapl.edu
AA3GU@W3ZH.MD.USA

1638. TrackSat 2.0 for FreeBSD?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 12:45:20 UTC
From: perry@jpunix.com
Message-ID: <373ft0$86n@jpunix.com>
Source record: 26744
Cross-posted to: rec.radio.amateur.space,comp.os.386bsd.misc

```
-----BEGIN PGP SIGNED MESSAGE-----

I was wondering if anyone out there has had any luck building Manfred's
TrackSat 2.0 under FreeBSD? The Linux port just doesn't quite make it.
Any help would be greatly appreciated.

John Perry - KG5RG - perry@jpunix.com

-----BEGIN PGP SIGNATURE-----
Version: 2.6.1

iQCVAwUBLpVC1VOTpEThrthvAQEO+wP/T04K/fmTGmUgc0s/fQY4828dhm0WCMvF
fvFXR2feA8JeLSUhUbb3Ng4jFdazLn8aVAC1JI51e0yCVZQPo0Dcph5IbcjZzKQX
BYhWL7+DmjSt6ePRKvyPebCcBDptHUDt0FipVtemBUBJ+RdI6OKvXmQdLJo1A1Eq
CgUbuq1mLMU=
=seZB
-----END PGP SIGNATURE-----
```

1639. Re: TrackSat 2.0 for FreeBSD?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 14:42:02 UTC
From: thomas@ghpc8.ihf.rwth-aachen.de
Message-ID: <373mnq$4e8@urmel.informatik.rwth-aachen.de>
Source record: 26741
Cross-posted to: rec.radio.amateur.space,comp.os.386bsd.misc

[Note: Followup-To trimmed to c.o.3.misc]

John A. Perry (perry@jpunix.com) wrote:
> I was wondering if anyone out there has had any luck building Manfred's
> TrackSat 2.0 under FreeBSD?

Try the ports/util/sattrack directory of your favourite FreeBSD archive.

tg

1640. * SpaceNews 10-Oct-94 *

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 15:16:57 UTC
From: magliaco@pilot.njin.net
Message-ID: <$spc1010.1994@ampr.org>
Source record: 26748
Cross-posted to: rec.radio.amateur.space,sci.space.news,rec.radio.info

SB NEWS @ AMSAT $SPC1010
* SpaceNews 10-Oct-94 *

BID: $SPC1010

=========
SpaceNews
=========

MONDAY OCTOBER 10, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is
published every week and is made available for unlimited free distribution.

* FO-20 NEWS *
==============
FO-20 was switched back into analog mode on a 14:30z pass of 28-Sep-94,
and it is not known whether it was a result of ground command or not.
The command station announced that the "Mailbox software ran away and
malfunctioning of UVC (Under Voltage Control) was confirmed by command
station. FO-20 will remain in Mode JA until 10 Oct.'94."

[Info via Kazu, JJ1WTK]

* NASA SPACELINK *
==================
For info on the upcoming Shuttle flight and other current NASA activities,
look under "Hot Topics" on NASA's Spacelink BBS. The BBS is located in
Huntsville, Alabama, USA, and may be reached at 1-205-895-0028. Internet
users may access the system via the TCP/IP address of 192.149.89.61.

The updated Spacelink system fully supports the following Internet services:

World Wide Web http://spacelink.msfc.nasa.gov
Gopher spacelink.msfc.nasa.gov
Anonymous FTP spacelink.msfc.nasa.gov
Telnet spacelink.msfc.nasa.gov

[Info via N5IST & N7PTM]

* REMINDER *
============
SpaceNews is a non-commercial electronic publication serving the interests
of Amateur Radio Operators and is available for unlimited distribution
provided no charge is made for its access.

SpaceNews has been distributed on the Amateur Packet Radio Network for seven years, and has recently been made available via the AMSAT-OSCAR-16 satellite file server. It is also available via the Internet by using the command "finger magliaco@pilot.njin.net".

Archives of past issues are available via anonymous FTP at pilot.njin.net in the /pub/SpaceNews sub-directory. Other sub-directories have been allocated for ham-related software, GIF images, and text information files.

* THANKS! *
==========
Thanks to all those who sent messages of appreciation to SpaceNews, especially:

KX1S WA1SOV ZL1MO N2TTT N2YQC G3XGY KD7AI HS0ZBO
David Desrocher Daniel Robino

* FEEDBACK/INPUT WELCOMED *
==========
Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107
PACKET : KD2BD @ N2KZH.NJ.USA.NA
INTERNET : kd2bd@ka2qhd.de.com -or- kd2bd@amsat.org
SATELLITE : AMSAT-OSCAR-16, LUSAT-OSCAR-19

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<=- SpaceNews: The first amateur newsletter read in space! -=>>

/EX

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1641. CETI Transmission '76

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 15:39:03 UTC
From: Shelley Snair <nstn1579@fox.nstn.ca>
Message-ID: <58122.nstn1579@fox.nstn.ca>
Source record: 26746

I've read a reference to a transmission recieved from deep space by CETI in '76 that was interpreted by their computer as E.Q.3.7.3. I have been unable to find any further details or references to this. Anybody have any helpful info?

--
Shelley Snair
nstn1579@fox.nstn.ca

1642. STS-68 Element Set (94280.681)

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 16:45:41 UTC
From: elements-request@alsys.com
Message-ID: <STS-68.94280.681@alsys.com>
Source record: 26747
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-68
1 23285U 94062A 94280.68166896 .00019593 12460-4 96455-5 0 106
2 23285 56.9938 43.3425 0009162 269.6198 90.3824 16.25130079 1182

Satellite: STS-68
Catalog number: 23285
Epoch time: 94280.68166896 = (07 OCT 94 16:21:36.19 UTC)
Element set: 010
Inclination: 56.9938 deg
RA of node: 43.3425 deg Space Shuttle Flight STS-68
Eccentricity: .0009162 Keplerian element set JSC-010
Arg of perigee: 269.6198 deg from NASA flight Day 8 vector
Mean anomaly: 90.3824 deg
Mean motion: 16.25130079 rev/day Gil Carman
Decay rate: 1.9593e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 118

--
--
Gary Morris Internet: garym@alsys.com
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1643. CLARC Balloon Launch

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 19:03:17 UTC
From: biekert@phoenix.phoenix.net
Message-ID: <37461l$iqu@dolphin.phoenix.net>
Source record: 26742

Near Outer Space Transportation System (NOSTS-1)
Balloon Launch - Clear Lake Amateur Radio Club
Sunday - October 9, 1994

***** UPDATE ***** 10/7/94
Balloon launch scheduled for launch window from 10am to 12noon Sun 10/9
from Wharton Airport, Wharton Texas
****

Near Outer Space Transportation System utilizing a 12 foot diameter
helium balloon as the launch vehicle. NOSTS-1 is an amateur radio
experiment which will carry a various payloads in a package weighing
less than 6 pounds. All interested hams are invited to participate.

The payload consists of:

* 2 meter packet on 145.75 MHz simplex - the node name for digipeating is
NOSTS-1, the mailbox callsign is KJ5MX-6, the beacon IDs as KJ5MX-3.

* 10 meter voice beacon on 28.322 MHz Double Side-Band with an ID interval
of 33 seconds

* Beacon on 29.420 MHz sending "CW" beeps that correspond directly to the
outside temperature. At 70 degrees Fahrenheit the beep rate is
approximately 200/min. To calculate temperature from beep rate the
formula: Temp(degrees F) = [0.56853 X (Beep rate)] - 38
The antenna for this device is a 2 meter dipole cut to enhance the 5th
harmonic at 147.10 MHz for direction finding purposes.

* Beacon on 224.72 MHz for direction finding purposes only.

* Potential secondary payloads may include a 10 GHz gigaplexer beacon and
a 2 meter uplink (147.435 MHz), 70 cm downlink (440.95 MHz) FM repeater.
Final announcements on these payloads will be made on launch day.

The Clear Lake Amateur Radio Club Balloon Launch Team wishes to thank
Andy MacAllister, WA5ZIB and members of the South Texas Balloon Launch
Team for assistance, advice, and use of 220 MHz beacon, 29.420 MHz fireball
transmitter for this launch.

An informal simultaneous HF (7.155 Mhz or up for QRM) and UHF (442.750 SE
Houston | 444.275 MHz NW Houston repeaters) net will be held at 7PM on
Saturday October 8th for final updates. The 40 meter net on the same
frequency will be active immediately before and during the flight.

The lauch site will be west of the Houston area and the direction of
flight will be from west to east. Coverage may extend several states
on some modes. Reception reports including frequency, time, and

YOUR location are encouraged.

For additional information and reception reports contact:

Dan Feeback, KJ5MX - (713) 286-0230 [Home] - (713) 483-7189 [Work]
Internet: feeback@medics.jsc.nasa.gov
Packet: KJ5MX@KA5KTH.#SETX.TX.USA.NOAM
or

John Maca, AB5SS - (713) 488-2025 [Home] - (713) 244-7774 [Work]
Internet: jmaca%jscdk@jesnic.jsc.nasa.gov
Packet: AB5SS@KA5KTH.#SETX.TX.USA.NOAM

--
Robert E. Biekert KA5GLX Houston, Texas
Email: biekert@phoenix.phoenix.net

1644. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 19:26:45 UTC
From: caralt@gaig.upc.es
Message-ID: <3747dlINNnq2@diable.upc.es>
Source record: 26750

[No readable article body recovered]

1645. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 19:29:34 UTC
From: caralt@gaig.upc.es
Message-ID: <3747iuINNob8@diable.upc.es>
Source record: 26751

[No readable article body recovered]

1646. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 19:34:06 UTC
From: caralt@gaig.upc.es
Message-ID: <3747reINNok0@diable.upc.es>
Source record: 26743

[No readable article body recovered]

1647. STS-68 Orbital State Vector Rev #118

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 19:54:27 UTC
From: astroman@netcom.com
Message-ID: <astromanCxBJAr.36r@netcom.com>
Source record: 26749
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 1017
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94280.68261223380
10/07/1994 16:22:57.697 UTC
ECI X: 15020015.927823 ft
M50 Y: 15437410.467789 ft
Z: 1689711.547567 ft
Xdot: -11119.25391 ft/s
Ydot: 8476.57812 ft/s
Zdot: 21367.92578 ft/s
ndot/2 (drag): 0.00258400083 rev/day^2
nddt/6: 2.73900E-07 rev/day^3
Bstar: 8.59739E-05 1/Earth Radii
Elset #: 15
Rev @ Epoch: 118.01546193727

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1648. Two-Line Orbital Element Sets (TLE483)

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 21:49:56 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.781566596@dolphin>
Source record: 26757

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #483 -
Alouette 1
1 00424U 62049 94275.80044483 .00000068 00000-0 70239-4 0 461
2 00424 80.4637 178.8259 0022274 196.4281 163.6139 13.67819708597110
ATS 1
1 02608U 66110A 94249.53724428 -.00000293 00000-0 10000-3 0 9060
2 02608 14.5927 359.6395 0009959 51.7405 82.5214 1.00347651 18288
ATS 3
1 03029U 67111A 94278.27737067 -.00000116 00000-0 10000-3 0 2737
2 03029 14.7208 6.3341 0009144 263.9604 98.0771 1.00272971 98540
Cosmos 398
1 04966U 71016A 94279.93008364 .00162177 72604-5 29039-3 0 5589
2 04966 51.4412 242.9231 0926748 341.8867 15.1252 14.11771865788404
Starlette
1 07646U 75010A 94273.92761046 -.00000122 00000-0 15885-4 0 8251
2 07646 49.8254 96.0886 0206169 325.5395 33.2273 13.82187392992475
LAGEOS
1 08820U 76039A 94279.75509948 .00000005 00000-0 10000-3 0 520
2 08820 109.8115 173.8092 0043806 261.1211 98.4598 6.38664241174274
ETS-2
1 09852U 77014A 94274.65414225 -.00000049 00000-0 10000-3 0 9963
2 09852 12.3464 40.2498 0003454 74.7232 23.6374 0.99997440 11394
GOES 2
1 10061U 77048A 94279.35164806 .00000070 00000-0 00000+0 0 4348
2 10061 11.3993 44.3804 0003417 50.0510 271.1719 1.00270885 8226
IUE
1 10637U 78012A 94279.49999999 -.00000199 00000-0 00000+0 0 612
2 10637 34.7560 93.0810 1312354 39.4840 8.2800 1.00310010 13729
GPS BI-01
1 10684U 78020A 94266.68618703 -.00000031 00000-0 10000-3 0 3041
2 10684 64.6986 42.5970 0063043 163.2254 197.0212 1.98069617106888
```

```
GPS BI-02
1 10893U 78047A 94276.86954768 .00000029 00000-0 10000-3 0 1197
2 10893 63.3955 280.9291 0216181 14.1654 346.4391 2.01626632120264
GOES 3
1 10953U 78062A 94279.46524014 .00000044 00000-0 10000-3 0 3961
2 10953 10.3419 47.1225 0005960 62.6284 254.3042 1.00276436 12830
SeaSat 1
1 10967U 78064A 94280.19016318 -.00000026 00000-0 35986-4 0 3437
2 10967 108.0030 334.0113 0001668 238.2151 121.8827 14.37980797852464
GPS BI-03
1 11054U 78093A 94276.25434251 .00000034 00000-0 10000-3 0 2378
2 11054 63.1801 278.5596 0044355 178.2059 181.8468 1.93505526116603
Nimbus 7
1 11080U 78098A 94280.17131371 -.00000111 00000-0 -62272-4 0 4453
2 11080 99.0385 159.5211 0008625 188.7884 171.3120 13.83722076805563
GPS BI-04
1 11141U 78112A 94279.30274571 -.00000023 00000-0 00000+0 0 9385
2 11141 64.7032 43.6409 0048329 26.5524 333.6803 1.92894843 5928
GPS BI-05
1 11690U 80011A 94270.62583752 -.00000002 00000-0 10000-3 0 8397
2 11690 65.0604 44.2107 0142187 196.1360 163.4389 2.00558184121592
GPS BI-06
1 11783U 80032A 94274.16075600 .00000043 00000-0 10000-3 0 187
2 11783 62.6427 274.6773 0211691 28.9674 332.2179 2.03456419106111
GOES 5
1 12472U 81049A 94273.66742022 -.00000092 00000-0 10000-3 0 8021
2 12472 7.0463 56.8631 0006329 26.6740 58.2985 1.00340135 6822
Cosmos 1383
1 13301U 82066A 94279.93105147 .00000019 00000-0 39990-5 0 3451
2 13301 82.9288 227.8130 0027754 143.3775 216.9278 13.68058236612708
LandSat 4
1 13367U 82072A 94279.16815345 .00000045 00000-0 19968-4 0 5490
2 13367 98.1692 335.6366 0006166 274.0329 86.0164 14.57132257650222
IRAS
1 13777U 83004A 94280.03991073 .00000304 00000-0 23925-3 0 7422
2 13777 98.9702 108.6617 0013657 10.5088 349.6347 13.99218850266786
Cosmos 1447
1 13916U 83021A 94271.57756641 .00000017 00000-0 15646-5 0 4358
2 13916 82.9448 295.2322 0039100 99.2375 261.3207 13.74313393577535
TDRS 1
1 13969U 83026B 94279.75481528 -.00000198 00000-0 10000-3 0 3580
2 13969 7.9307 49.6602 0046550 193.7078 128.3264 1.00276231 15169
GOES 6
1 14050U 83041A 94278.48442852 .00000057 00000-0 10000-3 0 2914
2 14050 5.8427 59.8837 0003472 3.5192 354.3284 1.00245170 13883
OSCAR 10
1 14129U 83058B 94274.43486862 .00000009 00000-0 10000-3 0 3153
2 14129 26.8409 305.1981 6029094 215.5270 82.9344 2.05880028 57002
LandSat 5
1 14780U 84021A 94279.13631887 .00000037 00000-0 18167-4 0 1419
```

```
2 14780 98.1530 336.6210 0003859 284.4658 75.6112 14.57143776563631
UoSat 2
1 14781U 84021B 94280.05570132 .00000133 00000-0 30314-4 0 7442
2 14781 97.7849 289.5407 0010794 274.8711 85.1258 14.69250936566734
GPS BI-09
1 15039U 84059A 94277.31298897 -.00000032 00000-0 10000-3 0 2465
2 15039 64.3826 38.1317 0081542 16.5375 343.7238 1.92302281 75470
Cosmos 1574
1 15055U 84062A 94279.66545525 .00000019 00000-0 45320-5 0 6474
2 15055 82.9591 342.8391 0026017 267.3668 92.4511 13.73610828515930
GPS BI-10
1 15271U 84097A 94277.32606168 .00000023 00000-0 10000-3 0 8746
2 15271 62.3039 274.7045 0149733 349.6218 10.0869 2.00586842 72794
Cosmos 1602
1 15331U 84105A 94271.91197780 .00000288 00000-0 31263-4 0 3256
2 15331 82.5352 340.5993 0018696 218.0918 141.8990 14.84462289539908
NOAA 9
1 15427U 84123A 94279.08195448 .00000091 00000-0 72215-4 0 9808
2 15427 99.0382 330.8004 0014172 267.5935 92.3609 14.13647641505929
GPS BI-11
1 16129U 85093A 94210.68349276 -.00000037 00000-0 10000-3 0 6188
2 16129 64.9965 42.6389 0150311 89.3128 272.4428 1.89368102 8885
Mir
1 16609U 86017A 94280.02167417 .00013746 00000-0 19106-3 0 7938
2 16609 51.6465 346.7504 0002920 106.3923 253.7399 15.57299031493441
SPOT 1
1 16613U 86019A 94277.27270451 .00000089 00000-0 62356-4 0 7337
2 16613 98.6819 348.9385 0000838 89.4593 270.6679 14.20058188132041
Cosmos 1766
1 16881U 86055A 94267.98696103 .00000160 00000-0 16529-4 0 2401
2 16881 82.5170 42.2292 0017588 259.7594 100.1640 14.83487883440251
EGP
1 16908U 86061A 94267.82750767 -.00000097 00000-0 00000+0 0 9328
2 16908 50.0138 138.0645 0011348 206.2638 153.7623 12.44410748 37792
NOAA 10
1 16969U 86073A 94279.03530104 .00000038 00000-0 34340-4 0 8811
2 16969 98.5096 284.6622 0013860 10.0679 350.0775 14.24907397418287
MOS-1
1 17527U 87018A 94280.02402392 -.00000040 00000-0 28920-5 0 1387
2 17527 99.0245 346.3075 0000627 22.5865 337.5311 13.94907004388531
GOES 7
1 17561U 87022A 94278.50076133 -.00000055 00000-0 10000-3 0 552
2 17561 1.7887 74.6069 0003429 8.6536 358.7721 1.00277528 11086
Kvant-1
1 17845U 87030A 94279.05910789 .00010482 00000-0 14753-3 0 149
2 17845 51.6471 351.5740 0002573 82.0995 278.0611 15.57265211493383
DMSP B5D2-3
1 18123U 87053A 94278.99845160 .00000050 00000-0 48018-4 0 6818
2 18123 98.7856 109.0530 0013259 223.0135 137.0003 14.15374198376760
RS-10/11
```

```
1 18129U 87054A 94279.98552238 .00000037 00000-0 24189-4 0 9716
2 18129 82.9231 246.1970 0013262 75.2276 285.0348 13.72342146365243
Meteor 2-16
1 18312U 87068A 94268.13960741 .00000059 00000-0 39331-4 0 3311
2 18312 82.5546 132.6008 0011508 186.8436 173.2569 13.84038707358884
Meteor 2-17
1 18820U 88005A 94278.79270277 .00000060 00000-0 40198-4 0 4268
2 18820 82.5442 180.6064 0015067 230.0231 129.9600 13.84722681337665
DMSP B5D2-4
1 18822U 88006A 94279.99850182 .00000027 00000-0 30429-4 0 7805
2 18822 98.4302 130.2752 0006617 21.0257 339.1199 14.23120661346505
Glonass 34
1 19163U 88043A 94267.43377799 .00000030 00000-0 10000-3 0 9313
2 19163 65.0594 107.1092 0008176 148.3684 211.7491 2.13102447 48772
Glonass 36
1 19165U 88043C 94274.52861493 .00000095 00000-0 10000-3 0 3283
2 19165 65.0413 106.8456 0004534 359.3045 0.7805 2.13102250 49546
METEOSAT 3
1 19215U 88051A 94279.14060299 -.00000264 00000-0 10000-3 0 136
2 19215 1.9719 71.6982 0000732 161.3311 117.8624 1.00268949 11020
AO-13
1 19216U 88051B 94278.87225355 -.00000531 00000-0 10000-4 0 9791
2 19216 57.7108 227.3374 7236237 351.8448 0.7071 2.09726440 16837
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2 19274 82.5146 142.5598 0021729 44.3500 315.9439 14.82217866335822
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2 19336 82.5351 253.1054 0017739 17.5351 342.6386 13.16968747296389
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2 19531 99.1809 270.6393 0011535 178.6309 181.4906 14.13018271310782
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2 19548 1.2571 76.7059 0003519 98.9563 183.5455 1.00268057 9310
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2 19749 65.0028 106.3783 0006091 253.7051 106.3148 2.13101351 44581
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2 19802 55.1498 135.3799 0032885 172.1102 188.1025 2.00559867 41238
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1 19876U 89020B 94278.88070192 -.00000077 00000-0 10000-3 0 793
2 19876 0.7566 67.2045 0000913 176.9649 79.3271 1.00275760 463
TDRS 3
1 19883U 89021B 94277.55050516 -.00000275 00000-0 00000+0 0 9988
2 19883 0.1048 36.9188 0006317 244.7826 248.5063 1.00270556192881
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2 20061 54.5916 312.0125 0137634 210.3091 148.9594 2.00564778 38960
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2 20103 82.9610 205.1695 0037533 340.4064 19.5644 13.73843397263686
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2 20185 54.9371 136.0630 0009324 282.8585 77.1351 2.00563073 37518
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2 20305 82.5539 193.6837 0007745 28.7031 331.4555 13.04407968237285
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SPOT 2
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Nadezhda 2
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TDRS 5
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SPOT 3
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IO-26
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ITAMSAT
1 22828U 93061F 94276.12717540 .00000047 00000-0 36568-4 0 3151
2 22828 98.6410 350.8797 0009370 240.5615 119.4653 14.28068001 21184
PO-28
1 22829U 93061G 94276.13467659 -.00000002 00000-0 17110-4 0 3307
2 22829 98.6424 350.9057 0009325 242.1756 117.8479 14.28042098 53107
KO-25
1 22830U 93061H 94276.12779474 .00000003 00000-0 18394-4 0 3438
2 22830 98.5461 346.9571 0010751 218.1034 141.9389 14.28064748 53106
GPS BIIA-23
1 22877U 93068A 94279.44332681 .00000007 00000-0 00000+0 0 1835
2 22877 55.2823 73.9751 0029745 296.9326 62.7671 2.00567877 6961
METEOSAT 6
1 22912U 93073B 94278.47808551 -.00000089 00000-0 00000+0 0 1535
2 22912 0.7127 266.3305 0002951 262.5604 7.8050 1.00271442 1633
HST Array
1 22920U 90037C 94280.04467971 .00005939 00000-0 48108-3 0 2224
2 22920 28.4689 220.5314 0003791 11.9227 348.1554 14.97747214 46278
Meteor 3-6
1 22969U 94003A 94276.13788510 .00000051 00000-0 10000-3 0 1122
2 22969 82.5620 340.0941 0015919 359.6488 0.4625 13.16724716 33058
TUBSAT-B
1 22970U 94003B 94279.68983498 .00000051 00000-0 10000-3 0 1040
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2 22970 82.5611 337.5565 0016312 350.3164 9.7612 13.16822679 33527
ODERACS A
1 22990U 94006B 94275.87334034 .01241558 11882-4 10000-4 0 2550
2 22990 56.9531 181.1715 0016571 4.8333 355.6801 16.51145506 37426
ODERACS B
1 22991U 94006C 94277.13419807 .08964689 11747-4 18828-3 0 2430
2 22991 56.9471 176.0597 0002015 78.0065 283.1536 16.46907725 37618
ODERACS E
1 22994U 94006F 94280.00281425 .00052048 11276-4 20489-3 0 1482
2 22994 56.9830 178.9455 0015433 55.7035 304.5412 15.87327742 37835
ODERACS F
1 22995U 94006G 94279.98628485 .00054498 11383-4 20995-3 0 1885
2 22995 56.9825 178.8501 0015376 56.3926 303.8421 15.87712423 37839
BREMSAT
1 22998U 94006H 94277.90152748 .00063672 00000-0 23904-3 0 1777
2 22998 56.9882 189.7987 0014537 69.7324 290.5312 15.87188383 21333
GPS BIIA-24
1 23027U 94016A 94276.53419622 -.00000066 00000-0 00000+0 0 1145
2 23027 54.9856 15.1095 0064931 193.5568 166.2839 2.00564901 4213
Glonass 62
1 23043U 94021A 94279.18386183 -.00000038 00000-0 00000+0 0 1136
2 23043 64.8029 345.5102 0007655 193.7513 166.2985 2.13103051 3797
Glonass 63
1 23044U 94021B 94279.06671427 -.00000037 00000-0 00000+0 0 972
2 23044 64.7939 345.5106 0030790 204.4607 155.4636 2.13102950 3791
Glonass 64
1 23045U 94021C 94279.24234386 -.00000038 00000-0 00000+0 0 1132
2 23045 64.7858 345.5258 0009203 36.4100 323.7252 2.13102982 3795
GOES 8
1 23051U 94022A 94277.55624421 -.00000186 00000-0 00000+0 0 1959
2 23051 0.2150 263.2889 0007889 21.9264 197.3660 1.00255585 1391
MSTI 2
1 23101U 94028A 94280.07895351 .00006294 00000-0 12463-3 0 970
2 23101 97.1113 112.2831 0014534 91.7235 268.5709 15.47306689 23341
STRV-1A
1 23125U 94034B 94278.73128768 .00003305 00000-0 74771-3 0 547
2 23125 6.9081 138.8286 7291752 268.9208 14.9580 2.27507601 2282
STRV-1B
1 23126U 94034C 94274.08658414 .00004235 00000-0 74904-3 0 505
2 23126 6.9328 141.0036 7298943 264.8391 16.5342 2.27064889 2070
Soyuz TM-19
1 23139U 94036A 94280.08585450 .00026358 00000-0 35941-3 0 1146
2 23139 51.6472 346.4311 0002620 100.8238 259.3674 15.57317569 15224
Nadezhda 4
1 23179U 94041A 94280.08413230 .00000147 00000-0 13559-3 0 432
2 23179 82.9494 335.4510 0037453 53.0582 307.3993 13.75659252 11670
Glonass 65
1 23203U 94050A 94278.91065578 .00000016 00000-0 00000+0 0 570
2 23203 64.8265 224.9738 0006742 156.1604 203.8552 2.13102138 1186
Glonass 66
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1 23204U 94050B 94279.14499883 .00000017 00000-0 00000+0 0 679
2 23204 64.8196 225.0034 0015347 341.6587 18.2708 2.13102329 1186
Glonass 67
1 23205U 94050C 94279.02782794 .00000017 00000-0 10000-4 0 589
2 23205 64.8263 224.9842 0003283 296.8796 63.0714 2.13102124 1184
ProgressM24
1 23215U 94052A 94280.08585450 .00026358 00000-0 35941-3 0 812
2 23215 51.6472 346.4311 0002620 100.8238 259.3674 15.57317569 6623
DMSP B5D2-7
1 23233U 94057A 94279.03900629 .00000118 00000-0 88004-4 0 577
2 23233 98.9157 333.9695 0012999 133.4236 226.8009 14.12539129 5283
1994056C
1 23248U 94056C 94278.35688680 -.00000042 00000-0 10000-3 0 168
2 23248 13.1127 95.1115 5209083 200.3516 127.3679 1.70199303 493
TELSTAR 402
1 23249U 94058A 94273.58498826 .00073227 00000-0 60430-2 0 145
2 23249 6.5559 160.2895 7294393 197.6492 109.1276 2.29072121 505
Cosmos 2291
1 23267U 94060A 94279.80864520 -.00000149 00000-0 00000+0 0 224
2 23267 1.4298 280.2204 0007159 73.3111 32.3871 1.00272124 151
1994060B
1 23268U 94060B 94268.09578600 .21691735 12784-4 16669-3 0 222
2 23268 51.6073 259.2490 0005202 298.6077 61.5231 16.52282919 557
1994060C
1 23269U 94060 C 94265.41103389 .13621660 00000-0 11070-2 0 61
2 23269 051.6074 274.3730 0002099 221.8841 138.2708 16.39060068000119
1994060D
1 23270U 94060D 94266.52259266 -.00000186 00000-0 10000-4 0 23
2 23270 1.4991 279.6655 0014064 359.0718 0.5948 1.00041851 15
1994060E
1 23271U 94060E 94279.81469531 .00000529 00000-0 46223-3 0 168
2 23271 47.4915 273.7531 7269272 3.8583 359.5247 2.26417369 383
1994060F
1 23272U 94060F 94279.34969657 .00001319 00000-0 43572-3 0 174
2 23272 47.4450 273.8465 7289599 3.7131 359.5647 2.26797636 367
Cosmos 2292
1 23278U 94061A 94277.98995670 .00000652 00000-0 62361-4 0 237
2 23278 82.9898 239.2511 1028109 111.2554 260.1413 13.22002256 988
1994061B
1 23279U 94061B 94279.86920279 .00000156 00000-0 10000-4 0 298
2 23279 82.9904 237.9566 1028260 105.7048 265.9786 13.23817658 1232
1994061C
1 23281U 94061C 94279.92585482 .00011961 00000-0 83159-3 0 167
2 23281 82.9969 237.8564 1052493 106.1264 265.8192 13.26821841 1246
STS 68
1 23285U 94062A 94280.25000000 .00020611 11099-4 10039-4 0 285
2 23285 56.9931 45.4345 0009334 299.6772 57.5316 16.22384282 1096
1994061D
1 23286U 94061D 94279.32950811 .00005667 00000-0 11943-2 0 109
2 23286 83.0729 238.1684 0969445 108.5381 262.3454 13.13212109 1153
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Soyuz TM-20
1 23288U 94063A 94278.86889464 .00180837 25460-4 24265-3 0 113
2 23288 51.6510 352.5617 0057352 128.0017 232.6197 16.02677397 315
1994063B
1 23289U 94063B 94279.63551980 .13661724 12607-4 28787-3 0 158
2 23289 51.6359 348.0107 0000966 29.8395 330.2636 16.46997558 446
1994064A
1 23305U 94064A 94279.53907779 -.00000006 00000-0 10000-4 0 10
2 23305 25.8956 297.4693 7419253 178.3878 187.3643 2.09284313 07
1994064B
1 23306U 94064B 94279.52992293 .02550198 -32487-5 64615-1 0 27
2 23306 26.3241 296.9606 7463432 179.1431 183.6163 2.09752297 08
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Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
```

1649. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-07 21:52:13 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.781566733@dolphin>
Source record: 26756

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 68
1 23285U 94062A 94280.25000000 .00020611 11099-4 10039-4 0 285
2 23285 56.9931 45.4345 0009334 299.6772 57.5316 16.22384282 1096
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Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1650. orbs$280.1of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-10-08 00:42:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-280.o.1994@ampr.org>
Source record: 26754
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-280.O
Orbital Elements 280.OSCAR

HR AMSAT ORBITAL ELEMENTS FOR OSCAR SATELLITES
FROM WA5QGD FORT WORTH,TX October 7, 1994
BID: $ORBS-280.O
TO ALL RADIO AMATEURS BT

Satellite: AO-10
Catalog number: 14129
Epoch time: 94274.43486862
Element set: 315
Inclination: 26.8409 deg
RA of node: 305.1981 deg
Eccentricity: 0.6029094
Arg of perigee: 215.5270 deg
Mean anomaly: 82.9344 deg
Mean motion: 2.05880028 rev/day
Decay rate: 9.0e-08 rev/day^2
Epoch rev: 8497
Checksum: 314

Satellite: UO-11
Catalog number: 14781
Epoch time: 94280.05570132
Element set: 744
Inclination: 97.7849 deg
RA of node: 289.5407 deg
Eccentricity: 0.0010794
Arg of perigee: 274.8711 deg
Mean anomaly: 85.1258 deg
Mean motion: 14.69250936 rev/day
Decay rate: 1.33e-06 rev/day^2
Epoch rev: 56673
Checksum: 332

Satellite: RS-10/11
Catalog number: 18129
Epoch time: 94279.98552238
Element set: 971
Inclination: 82.9231 deg
RA of node: 246.1970 deg
Eccentricity: 0.0013262
Arg of perigee: 75.2276 deg
```

Mean anomaly: 285.0348 deg
Mean motion: 13.72342146 rev/day
Decay rate: 3.7e-07 rev/day^2
Epoch rev: 36524
Checksum: 315

Satellite: AO-13
Catalog number: 19216
Epoch time: 94279.82589895
Element set: 980
Inclination: 57.7091 deg
RA of node: 227.1681 deg
Eccentricity: 0.7236196
Arg of perigee: 351.9333 deg
Mean anomaly: 0.7118 deg
Mean motion: 2.09723955 rev/day
Decay rate: -3.26e-06 rev/day^2
Epoch rev: 4835
Checksum: 343

Satellite: FO-20
Catalog number: 20480
Epoch time: 94280.40939116
Element set: 738
Inclination: 99.0559 deg
RA of node: 51.1170 deg
Eccentricity: 0.0541207
Arg of perigee: 85.3114 deg
Mean anomaly: 280.9553 deg
Mean motion: 12.83227882 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 21852
Checksum: 289

Satellite: AO-21
Catalog number: 21087
Epoch time: 94278.89635359
Element set: 526
Inclination: 82.9361 deg
RA of node: 60.7692 deg
Eccentricity: 0.0035589
Arg of perigee: 133.3909 deg
Mean anomaly: 227.0221 deg
Mean motion: 13.74545850 rev/day
Decay rate: 9.4e-07 rev/day^2
Epoch rev: 18479
Checksum: 340

Satellite: RS-12/13
Catalog number: 21089
Epoch time: 94280.01466294

Element set: 743
Inclination: 82.9199 deg
RA of node: 288.5164 deg
Eccentricity: 0.0029834
Arg of perigee: 154.5663 deg
Mean anomaly: 205.6970 deg
Mean motion: 13.74047489 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 18400
Checksum: 332

Satellite: ARSENE
Catalog number: 22654
Epoch time: 94278.90721955
Element set: 291
Inclination: 2.0802 deg
RA of node: 94.2592 deg
Eccentricity: 0.2911798
Arg of perigee: 193.1780 deg
Mean anomaly: 157.9888 deg
Mean motion: 1.42203095 rev/day
Decay rate: -8.7e-07 rev/day^2
Epoch rev: 277
Checksum: 322

/EX
SB KEPS @ AMSAT $ORBS-280.D
Orbital Elements 280.MICROS

HR AMSAT ORBITAL ELEMENTS FOR THE MICROSATS
FROM WA5QGD FORT WORTH,TX October 7, 1994
BID: $ORBS-280.D
TO ALL RADIO AMATEURS BT

Satellite: UO-14
Catalog number: 20437
Epoch time: 94280.18867452
Element set: 43
Inclination: 98.5863 deg
RA of node: 3.4207 deg
Eccentricity: 0.0010360
Arg of perigee: 220.3418 deg
Mean anomaly: 139.6999 deg
Mean motion: 14.29856915 rev/day
Decay rate: 1.0e-08 rev/day^2
Epoch rev: 24559
Checksum: 311

Satellite: AO-16
Catalog number: 20439
Epoch time: 94280.24002223
Element set: 841

Inclination: 98.5955 deg
RA of node: 4.8269 deg
Eccentricity: 0.0010596
Arg of perigee: 221.8837 deg
Mean anomaly: 138.1539 deg
Mean motion: 14.29910670 rev/day
Decay rate: -9.0e-08 rev/day^2
Epoch rev: 24561
Checksum: 307

Satellite: DO-17
Catalog number: 20440
Epoch time: 94280.25338488
Element set: 842
Inclination: 98.5962 deg
RA of node: 5.2019 deg
Eccentricity: 0.0010818
Arg of perigee: 220.2754 deg
Mean anomaly: 139.7626 deg
Mean motion: 14.30050727 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 24563
Checksum: 292

Satellite: WO-18
Catalog number: 20441
Epoch time: 94280.23074718
Element set: 845
Inclination: 98.5956 deg
RA of node: 5.1710 deg
Eccentricity: 0.0011296
Arg of perigee: 220.7550 deg
Mean anomaly: 139.2789 deg
Mean motion: 14.30024326 rev/day
Decay rate: -1.7e-07 rev/day^2
Epoch rev: 24563
Checksum: 292

Satellite: LO-19
Catalog number: 20442
Epoch time: 94279.78155006
Element set: 840
Inclination: 98.5966 deg
RA of node: 5.0139 deg
Eccentricity: 0.0011562
Arg of perigee: 222.0533 deg
Mean anomaly: 137.9763 deg
Mean motion: 14.30122291 rev/day
Decay rate: 1.1e-07 rev/day^2
Epoch rev: 24558
Checksum: 288

Satellite: UO-22
Catalog number: 21575
Epoch time: 94280.17559102
Element set: 547
Inclination: 98.4264 deg
RA of node: 352.3581 deg
Eccentricity: 0.0007497
Arg of perigee: 322.8605 deg
Mean anomaly: 37.2069 deg
Mean motion: 14.36934048 rev/day
Decay rate: 2.5e-07 rev/day^2
Epoch rev: 16916
Checksum: 316

Satellite: KO-23
Catalog number: 22077
Epoch time: 94280.43439393
Element set: 440
Inclination: 66.0816 deg
RA of node: 44.9601 deg
Eccentricity: 0.0015333
Arg of perigee: 260.6656 deg
Mean anomaly: 99.2625 deg
Mean motion: 12.86287889 rev/day
Decay rate: -3.7e-07 rev/day^2
Epoch rev: 10122
Checksum: 309

Satellite: AO-27
Catalog number: 22825
Epoch time: 94276.09844924
Element set: 338
Inclination: 98.6450 deg
RA of node: 350.7766 deg
Eccentricity: 0.0007917
Arg of perigee: 257.5293 deg
Mean anomaly: 102.5036 deg
Mean motion: 14.27636072 rev/day
Decay rate: 3.4e-07 rev/day^2
Epoch rev: 5308
Checksum: 322

Satellite: IO-26
Catalog number: 22826
Epoch time: 94276.14163591
Element set: 336
Inclination: 98.6421 deg
RA of node: 350.8706 deg
Eccentricity: 0.0008492
Arg of perigee: 256.8184 deg
Mean anomaly: 103.2049 deg
Mean motion: 14.27740626 rev/day

Decay rate: 2.0e-08 rev/day^2
Epoch rev: 5309
Checksum: 303

Satellite: KO-25
Catalog number: 22830
Epoch time: 94280.19155718
Element set: 344
Inclination: 98.5460 deg
RA of node: 350.9336 deg
Eccentricity: 0.0010876
Arg of perigee: 205.6748 deg
Mean anomaly: 154.3899 deg
Mean motion: 14.28065096 rev/day
Decay rate: 5.0e-08 rev/day^2
Epoch rev: 5368
Checksum: 327

Satellite: 22828
Catalog number: 22828
Epoch time: 94276.12717540
Element set: 315
Inclination: 98.6410 deg
RA of node: 350.8797 deg
Eccentricity: 0.0009370
Arg of perigee: 240.5615 deg
Mean anomaly: 119.4653 deg
Mean motion: 14.28068001 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 2118
Checksum: 309

/EX

1651. orbs$280.2of2.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-10-08 00:44:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-280.w.1994@ampr.org>
Source record: 26753
Cross-posted to: rec.radio.amateur.space,rec.radio.info

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SB KEPS @ AMSAT $ORBS-280.W
Orbital Elements 280.WEATHER

HR AMSAT ORBITAL ELEMENTS FOR WEATHER SATELLITES
FROM WA5QGD FORT WORTH,TX October 7, 1994
BID: $ORBS-280.W
TO ALL RADIO AMATEURS BT

Satellite: NOAA-9
Catalog number: 15427
Epoch time: 94280.07285109
Element set: 981
Inclination: 99.0382 deg
RA of node: 331.8016 deg
Eccentricity: 0.0014179
Arg of perigee: 264.4499 deg
Mean anomaly: 95.5060 deg
Mean motion: 14.13647422 rev/day
Decay rate: 4.7e-07 rev/day^2
Epoch rev: 50606
Checksum: 312

Satellite: NOAA-10
Catalog number: 16969
Epoch time: 94280.01837931
Element set: 882
Inclination: 98.5098 deg
RA of node: 285.6156 deg
Eccentricity: 0.0013771
Arg of perigee: 7.2432 deg
Mean anomaly: 352.8945 deg
Mean motion: 14.24907436 rev/day
Decay rate: 2.8e-07 rev/day^2
Epoch rev: 41842
Checksum: 330

Satellite: MET-2/17
Catalog number: 18820
Epoch time: 94280.16559409
Element set: 427
Inclination: 82.5443 deg
RA of node: 179.5150 deg
Eccentricity: 0.0015090
Arg of perigee: 225.5626 deg
```

Mean anomaly: 134.4304 deg
Mean motion: 13.84722814 rev/day
Decay rate: 6.1e-07 rev/day^2
Epoch rev: 33785
Checksum: 304

Satellite: MET-3/2
Catalog number: 19336
Epoch time: 94280.37364702
Element set: 339
Inclination: 82.5377 deg
RA of node: 244.2864 deg
Eccentricity: 0.0017353
Arg of perigee: 347.4174 deg
Mean anomaly: 12.6506 deg
Mean motion: 13.16969436 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 29802
Checksum: 314

Satellite: NOAA-11
Catalog number: 19531
Epoch time: 94279.95078024
Element set: 798
Inclination: 99.1813 deg
RA of node: 271.6559 deg
Eccentricity: 0.0011546
Arg of perigee: 175.6535 deg
Mean anomaly: 184.4743 deg
Mean motion: 14.13018598 rev/day
Decay rate: 1.3e-07 rev/day^2
Epoch rev: 31092
Checksum: 327

Satellite: MET-2/18
Catalog number: 19851
Epoch time: 94278.87625758
Element set: 340
Inclination: 82.5177 deg
RA of node: 55.6653 deg
Eccentricity: 0.0012800
Arg of perigee: 276.8640 deg
Mean anomaly: 83.1229 deg
Mean motion: 13.84372952 rev/day
Decay rate: 1.6e-07 rev/day^2
Epoch rev: 28300
Checksum: 324

Satellite: MET-3/3
Catalog number: 20305
Epoch time: 94280.21738469

Element set: 166
Inclination: 82.5540 deg
RA of node: 192.5175 deg
Eccentricity: 0.0007367
Arg of perigee: 21.7005 deg
Mean anomaly: 338.4447 deg
Mean motion: 13.04410031 rev/day
Decay rate: 4.4e-07 rev/day^2
Epoch rev: 23750
Checksum: 270

Satellite: MET-2/19
Catalog number: 20670
Epoch time: 94280.56321360
Element set: 841
Inclination: 82.5454 deg
RA of node: 119.2255 deg
Eccentricity: 0.0015007
Arg of perigee: 187.7959 deg
Mean anomaly: 172.2974 deg
Mean motion: 13.84180733 rev/day
Decay rate: 4.3e-07 rev/day^2
Epoch rev: 21616
Checksum: 305

Satellite: FY-1/2
Catalog number: 20788
Epoch time: 94279.07116574
Element set: 138
Inclination: 98.8211 deg
RA of node: 295.6389 deg
Eccentricity: 0.0016428
Arg of perigee: 67.8762 deg
Mean anomaly: 292.4146 deg
Mean motion: 14.01324652 rev/day
Decay rate: -2.7e-07 rev/day^2
Epoch rev: 20923
Checksum: 323

Satellite: MET-2/20
Catalog number: 20826
Epoch time: 94279.89406198
Element set: 850
Inclination: 82.5225 deg
RA of node: 57.0952 deg
Eccentricity: 0.0014686
Arg of perigee: 93.0632 deg
Mean anomaly: 267.2207 deg
Mean motion: 13.83590059 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 20320

Checksum: 303

Satellite: MET-3/4
Catalog number: 21232
Epoch time: 94280.49972184
Element set: 748
Inclination: 82.5379 deg
RA of node: 90.1968 deg
Eccentricity: 0.0012029
Arg of perigee: 268.3814 deg
Mean anomaly: 91.5928 deg
Mean motion: 13.16464985 rev/day
Decay rate: 5.0e-07 rev/day^2
Epoch rev: 16613
Checksum: 330

Satellite: NOAA-12
Catalog number: 21263
Epoch time: 94280.03736640
Element set: 216
Inclination: 98.6093 deg
RA of node: 305.3108 deg
Eccentricity: 0.0012029
Arg of perigee: 274.3450 deg
Mean anomaly: 85.6355 deg
Mean motion: 14.22453054 rev/day
Decay rate: 1.08e-06 rev/day^2
Epoch rev: 17640
Checksum: 271

Satellite: MET-3/5
Catalog number: 21655
Epoch time: 94280.27938026
Element set: 746
Inclination: 82.5532 deg
RA of node: 37.5695 deg
Eccentricity: 0.0012228
Arg of perigee: 280.2757 deg
Mean anomaly: 79.6986 deg
Mean motion: 13.16834162 rev/day
Decay rate: 5.1e-07 rev/day^2
Epoch rev: 15121
Checksum: 317

Satellite: MET-2/21
Catalog number: 22782
Epoch time: 94280.57718550
Element set: 349
Inclination: 82.5469 deg
RA of node: 117.3866 deg
Eccentricity: 0.0021298

Arg of perigee: 273.4139 deg
Mean anomaly: 86.4563 deg
Mean motion: 13.83016031 rev/day
Decay rate: 5.3e-07 rev/day^2
Epoch rev: 5562
Checksum: 315

/EX
SB KEPS @ AMSAT $ORBS-280.M
Orbital Elements 280.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH,TX October 7, 1994
BID: $ORBS-280.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94276.13467659
Element set: 330
Inclination: 98.6424 deg
RA of node: 350.9057 deg
Eccentricity: 0.0009325
Arg of perigee: 242.1756 deg
Mean anomaly: 117.8479 deg
Mean motion: 14.28042098 rev/day
Decay rate: -2.0e-08 rev/day^2
Epoch rev: 5310
Checksum: 304

Satellite: MIR
Catalog number: 16609
Epoch time: 94280.02167417
Element set: 793
Inclination: 51.6465 deg
RA of node: 346.7504 deg
Eccentricity: 0.0002920
Arg of perigee: 106.3923 deg
Mean anomaly: 253.7399 deg
Mean motion: 15.57299031 rev/day
Decay rate: 1.3746e-04 rev/day^2
Epoch rev: 49344
Checksum: 317

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94279.22901726
Element set: 549
Inclination: 28.4701 deg
RA of node: 242.6635 deg
Eccentricity: 0.0006329
Arg of perigee: 167.0259 deg

Mean anomaly: 193.0487 deg
Mean motion: 14.90685554 rev/day
Decay rate: 5.75e-06 rev/day^2
Epoch rev: 4597
Checksum: 323

Satellite: GRO
Catalog number: 21225
Epoch time: 94280.04311536
Element set: 154
Inclination: 28.4603 deg
RA of node: 175.3775 deg
Eccentricity: 0.0003493
Arg of perigee: 41.6689 deg
Mean anomaly: 318.4194 deg
Mean motion: 15.41351885 rev/day
Decay rate: 3.287e-05 rev/day^2
Epoch rev: 7421
Checksum: 292

Satellite: UARS
Catalog number: 21701
Epoch time: 94278.86796087
Element set: 610
Inclination: 56.9841 deg
RA of node: 75.5253 deg
Eccentricity: 0.0004456
Arg of perigee: 97.5154 deg
Mean anomaly: 262.6386 deg
Mean motion: 14.96505569 rev/day
Decay rate: 1.004e-05 rev/day^2
Epoch rev: 16750
Checksum: 324

/EX

1652. orbs$280.2l.amsat

Newsgroup: rec.radio.amateur.space
Date: 1994-10-08 00:44:00 UTC
From: ray.hoad@drig.com
Message-ID: <$orbs-280.n.1994@ampr.org>
Source record: 26755
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEPS @ AMSAT $ORBS-280.N
2Line Orbital Elements 280.AMSAT

HR AMSAT ORBITAL ELEMENTS FOR AMATEUR SATELLITES IN NASA FORMAT
FROM WA5QGD FORT WORTH,TX October 7, 1994
BID: $ORBS-280.N

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

TO ALL RADIO AMATEURS BT

AO-10
1 14129U 83058B 94274.43486862 .00000009 00000-0 10000-3 0 3153
2 14129 26.8409 305.1981 6029094 215.5270 82.9344 2.05880028 84978
UO-11
1 14781U 84021B 94280.05570132 .00000133 00000-0 30314-4 0 7442
2 14781 97.7849 289.5407 0010794 274.8711 85.1258 14.69250936566734
RS-10/11
1 18129U 87054A 94279.98552238 .00000037 00000-0 24189-4 0 9716
2 18129 82.9231 246.1970 0013262 75.2276 285.0348 13.72342146365243
AO-13
1 19216U 88051B 94279.82589895 -.00000326 00000-0 10000-4 0 9803
2 19216 57.7091 227.1681 7236196 351.9333 0.7118 2.09723955 48357
FO-20
1 20480U 90013C 94280.40939116 .00000001 00000-0 66623-4 0 7382
2 20480 99.0559 51.1170 0541207 85.3114 280.9553 12.83227882218522
AO-21
1 21087U 91006A 94278.89635359 .00000094 00000-0 82657-4 0 5263
2 21087 82.9361 60.7692 0035589 133.3909 227.0221 13.74545850184794
RS-12/13
1 21089U 91007A 94280.01466294 .00000053 00000-0 39986-4 0 7436
2 21089 82.9199 288.5164 0029834 154.5663 205.6970 13.74047489184009
ARSENE
1 22654U 93031B 94278.90721955 -.00000087 00000-0 00000 0 0 2913
2 22654 2.0802 94.2592 2911798 193.1780 157.9888 1.42203095 2778
UO-14
1 20437U 90005B 94280.18867452 .00000001 00000-0 17448-4 0 433
2 20437 98.5863 3.4207 0010360 220.3418 139.6999 14.29856915245594
AO-16
1 20439U 90005D 94280.24002223 -.00000009 00000-0 13633-4 0 8416
```

```
2 20439 98.5955 4.8269 0010596 221.8837 138.1539 14.29910670245619
DO-17
1 20440U 90005E 94280.25338488 .00000005 00000-0 18740-4 0 8424
2 20440 98.5962 5.2019 0010818 220.2754 139.7626 14.30050727245631
WO-18
1 20441U 90005F 94280.23074718 -.00000017 00000-0 10385-4 0 8450
2 20441 98.5956 5.1710 0011296 220.7550 139.2789 14.30024326245633
LO-19
1 20442U 90005G 94279.78155006 .00000011 00000-0 21381-4 0 8405
2 20442 98.5966 5.0139 0011562 222.0533 137.9763 14.30122291245582
UO-22
1 21575U 91050B 94280.17559102 .00000025 00000-0 23148-4 0 5476
2 21575 98.4264 352.3581 0007497 322.8605 37.2069 14.36934048169167
KO-23
1 22077U 92052B 94280.43439393 -.00000037 00000-0 10000-3 0 4403
2 22077 66.0816 44.9601 0015333 260.6656 99.2625 12.86287889101225
AO-27
1 22825U 93061C 94276.09844924 .00000034 00000-0 31673-4 0 3384
2 22825 98.6450 350.7766 0007917 257.5293 102.5036 14.27636072 53085
IO-26
1 22826U 93061D 94276.14163591 .00000002 00000-0 18561-4 0 3369
2 22826 98.6421 350.8706 0008492 256.8184 103.2049 14.27740626 53093
KO-25
1 22830U 93061H 94280.19155718 .00000005 00000-0 19554-4 0 3441
2 22830 98.5460 350.9336 0010876 205.6748 154.3899 14.28065096 53684
22828
1 22828U 93061F 94276.12717540 .00000047 00000-0 36568-4 0 3151
2 22828 98.6410 350.8797 0009370 240.5615 119.4653 14.28068001 21184
NOAA-9
1 15427U 84123A 94280.07285109 .00000047 00000-0 49180-4 0 9810
2 15427 99.0382 331.8016 0014179 264.4499 95.5060 14.13647422506060
NOAA-10
1 16969U 86073A 94280.01837931 .00000028 00000-0 30001-4 0 8829
2 16969 98.5098 285.6156 0013771 7.2432 352.8945 14.24907436418427
MET-2/17
1 18820U 88005A 94280.16559409 .00000061 00000-0 41446-4 0 4278
2 18820 82.5443 179.5150 0015090 225.5626 134.4304 13.84722814337853
MET-3/2
1 19336U 88064A 94280.37364702 .00000051 00000-0 10000-3 0 3391
2 19336 82.5377 244.2864 0017353 347.4174 12.6506 13.16969436298024
NOAA-11
1 19531U 88089A 94279.95078024 .00000013 00000-0 32277-4 0 7984
2 19531 99.1813 271.6559 0011546 175.6535 184.4743 14.13018598310922
MET-2/18
1 19851U 89018A 94278.87625758 .00000016 00000-0 14818-5 0 3402
2 19851 82.5177 55.6653 0012800 276.8640 83.1229 13.84372952283002
MET-3/3
1 20305U 89086A 94280.21738469 .00000044 00000-0 10000-3 0 1662
2 20305 82.5540 192.5175 0007367 21.7005 338.4447 13.04410031237501
MET-2/19
```

```
1 20670U 90057A 94280.56321360 .00000043 00000-0 25068-4 0 8413
2 20670 82.5454 119.2255 0015007 187.7959 172.2974 13.84180733216165
FY-1/2
1 20788U 90081A 94279.07116574 -.00000027 00000-0 10000-4 0 1385
2 20788 98.8211 295.6389 0016428 67.8762 292.4146 14.01324652209237
MET-2/20
1 20826U 90086A 94279.89406198 .00000050 00000-0 31761-4 0 8500
2 20826 82.5225 57.0952 0014686 93.0632 267.2207 13.83590059203206
MET-3/4
1 21232U 91030A 94280.49972184 .00000050 00000-0 10000-3 0 7481
2 21232 82.5379 90.1968 0012029 268.3814 91.5928 13.16464985166133
NOAA-12
1 21263U 91032A 94280.03736640 .00000108 00000-0 67579-4 0 2160
2 21263 98.6093 305.3108 0012029 274.3450 85.6355 14.22453054176400
MET-3/5
1 21655U 91056A 94280.27938026 .00000051 00000-0 10000-3 0 7460
2 21655 82.5532 37.5695 0012228 280.2757 79.6986 13.16834162151217
MET-2/21
1 22782U 93055A 94280.57718550 .00000053 00000-0 35381-4 0 3495
2 22782 82.5469 117.3866 0021298 273.4139 86.4563 13.83016031 55626
POSAT
1 22829U 93061G 94276.13467659 -.00000002 00000-0 17110-4 0 3307
2 22829 98.6424 350.9057 0009325 242.1756 117.8479 14.28042098 53107
MIR
1 16609U 86017A 94280.02167417 .00013746 00000-0 19106-3 0 7938
2 16609 51.6465 346.7504 0002920 106.3923 253.7399 15.57299031493441
HUBBLE
1 20580U 90037B 94279.22901726 .00000575 00000-0 42122-4 0 5497
2 20580 28.4701 242.6635 0006329 167.0259 193.0487 14.90685554 45971
GRO
1 21225U 91027B 94280.04311536 .00003287 00000-0 70329-4 0 1545
2 21225 28.4603 175.3775 0003493 41.6689 318.4194 15.41351885 74210
UARS
1 21701U 91063B 94278.86796087 .00001004 00000-0 10867-3 0 6101
2 21701 56.9841 75.5253 0004456 97.5154 262.6386 14.96505569167505
/EX
```

1653. ARLK045 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-10-08 18:23:49 UTC
From: w1aw@arrl.org
Message-ID: <$arlk045.1994@ampr.org>
Source record: 26752
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK045
ARLK045 Keplerian data

ZCZC SK13
QST de W1AW
Keplerian Bulletin 45 ARLK045
From ARRL Headquarters
Newington, CT October 8, 1994
To all radio amateurs

SB KEP ARL ARLK045
ARLK045 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-68
1 23285U 94062A 94280.25000000 .00020611 11099-4 10039-4 0 285
2 23285 56.9931 45.4345 0009334 299.6772 57.5316 16.22384282 1096
AO-10
1 14129U 83058B 94274.43486862 .00000009 00000-0 10000-3 0 3153
2 14129 26.8409 305.1981 6029094 215.5270 82.9344 2.05880028 57002
RS-10/11
1 18129U 87054A 94279.98552238 .00000037 00000-0 24189-4 0 9716
2 18129 82.9231 246.1970 0013262 75.2276 285.0348 13.72342146365243
UO-11
1 14781U 84021B 94280.05570132 .00000133 00000-0 30314-4 0 7442
2 14781 97.7849 289.5407 0010794 274.8711 85.1258 14.69250936566734
RS-12/13
1 21089U 91007A 94280.01466294 .00000053 00000-0 39986-4 0 7436
2 21089 82.9199 288.5164 0029834 154.5663 205.6970 13.74047489184009
AO-13
1 19216U 88051B 94279.82589895 -.00000326 00000-0 10000-4 0 9803
2 19216 57.7091 227.1681 7236196 351.9333 0.7118 2.09723955 16857
UO-14
1 20437U 90005B 94280.18867452 .00000001 00000-0 17448-4 0 433
2 20437 98.5863 3.4207 0010360 220.3418 139.6999 14.29856915245594
AO-16
1 20439U 90005D 94280.24002223 -.00000009 00000-0 13633-4 0 8416
2 20439 98.5955 4.8269 0010596 221.8837 138.1539 14.29910670245619
```

```
DO-17
1 20440U 90005E 94280.25338488 .00000005 00000-0 18740-4 0 8424
2 20440 98.5962 5.2019 0010818 220.2754 139.7626 14.30050727245631
WO-18
1 20441U 90005F 94280.23074718 -.00000017 00000-0 10385-4 0 8450
2 20441 98.5956 5.1710 0011296 220.7550 139.2789 14.30024326245633
LO-19
1 20442U 90005G 94279.78155006 .00000011 00000-0 21381-4 0 8405
2 20442 98.5966 5.0139 0011562 222.0533 137.9763 14.30122291245582
FO-20
1 20480U 90013C 94280.40939116 .00000001 00000-0 66623-4 0 7382
2 20480 99.0559 51.1170 0541207 85.3114 280.9553 12.83227882218522
AO-21
1 21087U 91006A 94278.89635359 .00000094 00000-0 82657-4 0 5263
2 21087 82.9361 60.7692 0035589 133.3909 227.0221 13.74545850184794
UO-22
1 21575U 91050B 94280.17559102 .00000025 00000-0 23148-4 0 5476
2 21575 98.4264 352.3581 0007497 322.8605 37.2069 14.36934048169167
KO-23
1 22077U 92052B 94280.43439393 -.00000037 00000-0 10000-3 0 4403
2 22077 66.0816 44.9601 0015333 260.6656 99.2625 12.86287889101225
KO-25
1 22830U 93061H 94280.19155718 .00000005 00000-0 19554-4 0 3441
2 22830 98.5460 350.9336 0010876 205.6748 154.3899 14.28065096 53684
KO-25?
1 22828U 93061F 94276.12717540 .00000047 00000-0 36568-4 0 3151
2 22828 98.6410 350.8797 0009370 240.5615 119.4653 14.28068001 21184
IO-26
1 22826U 93061D 94276.14163591 .00000002 00000-0 18561-4 0 3369
2 22826 98.6421 350.8706 0008492 256.8184 103.2049 14.27740626 53093
AO-27
1 22825U 93061C 94276.09844924 .00000034 00000-0 31673-4 0 3384
2 22825 98.6450 350.7766 0007917 257.5293 102.5036 14.27636072 53085
PO-28
1 22829U 93061G 94276.13467659 -.00000002 00000-0 17110-4 0 3307
2 22829 98.6424 350.9057 0009325 242.1756 117.8479 14.28042098 53107
Mir
1 16609U 86017A 94280.02167417 .00013746 00000-0 19106-3 0 7938
2 16609 51.6465 346.7504 0002920 106.3923 253.7399 15.57299031493441

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
October 11, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1654. Radio Meteor Obs Sep 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-10-08 21:51:02 UTC
From: steyaert@vvs.innet.be
Message-ID: <steyaert.32.0015DA13@vvs.innet.be>
Source record: 26758

Radio Meteor Observation Bulletin No. 14 October 1994

1. FORWARD SCATTER METEOR OBSERVATIONS

Observer: M. De Meyere
Location: Deurle, Belgium (3 37' E, 51 00' N)
Frequency: 66.17 MHz
Transmitter Locations:
Katowice, PR3, Poland, 65.99 MHz, 14 kW, Distance 1100 km
P. Neant, PR3, Romania, 66.17 MHz, 40 kW, Distance 1400 km
Czestochowa, PR3, Poland, 66.23 MHz, 20 kW, Distance 1080 km
Gdansk, PR3, Poland, 66.29 MHz, 40 kW, Distance 1100 km

Antenna: crossed Yagi, 4 elements, Azimuth 270 o (=East), elevation 30 o
Antenna amplifier: 25 dB max level 90 dBmuV
Receiver: commercial, Progresson 447A, TESLA, Bratislava
Sensitivity: 8 muV for S/N = 26 dB (300 Ohm)
Observing method: automated setup, 150 samples/second, 8 bit resolution.
[Time and details of all individual meteor reflections are stored on file
in the University of Ghent format (Prometeos), and are available for
further analysis. Reduction software for DOS and Windows available].

Raw counts of reflections with a duration of at least 0.027 s
during one hour interval starting at UT:

September 1994

Sep 1994	20h	21	22	23	00	01	02	03	04	05	06	07
1- 2	-	52	55	51	1%	7%	50	94	118	90	103	-
2- 3	67	49	59	48	7%	0%	65	90	76	79	65	-
3- 4	36	68	50	50	33%	5%	18%	55	95	78	124	-
4- 5	49	65	47	46	10%	0%	53	76	74	81	96	-
5 -6	37	47	36	41	20%	2%	70	62	72	81	97	-
6- 7	40	60	56	45	21%	0%	49	75	89	69	61	-
7- 8	31	53	50	68	2%	10%	62	111	84	97	-	-
8- 9	112	66	77	57	3%	1%	60	86	95	94	85	-
9-10	50	58	72	64	21%	2%	63	73	72	74	65	-
10-11	36	-	-	-	-	-	-	-	-	-	-	-
11-12	-	-	-	-	-	-	-	-	-	-	-	-
12-13	-	44	43	36	7%	0%	40	43	46	61	-	-
13-14	38	66	57	51	20%	4%	76	77	69	97	-	-
14-15	35	50	37	50	14%	12%	38	74	81	78	67	-
15-16	26	46	60	57	51%	29%	64	83	97	89	81	-
16-17	33	45	56	44	35	9%	1%	31	61	61	59	-

```
17-18 | 50 45 40 45 13% 0% 54 81 90 73 70 -
18-19 | 40 36 39 41 1% 1% 26 75 64 61 44 -
19-20 | 42 49 58 55 4% 1% 30 62 83 69 64 -
20-21 | 37 48 59 60 29% 3% 27 63 58 64 55 -
21-22 | 29 39 35 32 2% 1% 26 54 54 58 39 -
22-23 | 37 36 32 53 9% 9% 16 58 48 55 63 -
23-24 | 50 51 42 62 50 21% 11% 13% 56 75 74 77
24-25 | 54 56 76 55 66 13% 0% 31% 64 74 76 44
25-26 | 39 38 58 76 30 3% 0% 26 44 63 66 46
26-27 | 43 46 52 36 34 6% 11% 42 50 63 46 63
27-28 | - - 55 28 38 4% 0% 19 50 57 64 54
28-29 | 39 40 66 29 26 11% 0% 38 59 44 58 41
29-30 | 44 42 38 47 31 4% 1% 26 50 68 55 60
------|------------------------------------------------------------------
1994 | 20h 21 22 23 00 01 02 03 04 05 06 07
Sep |
```

Notes:

. % : transmitter outage during the whole hour or a part of it. Low counts indicate that no other interference, which could be confused with meteors, is picked up.
Few transmitters are broadcasting between 2h-4h local time (Sat-Sun 3h-5h local time) or sometimes longer. (When winter hour is in use: local time = UT + 1h).
The switch to winter hour took place during the night of Sept 24-25.

. & : manually eliminated for direct reception.

M. De Meyere / C. Steyaert

Observer: Roger Stapleton
Location: St. Andrews, Scotland (2 50' W, 56 20' N)
Frequency: 70.31 MHz
Transmitter Locations:
Gdansk, Poland, 70.31 MHz, 40 kW
Opole, Poland, 70.31 MHz, 60 kW
Plzen, Czech Rep, 70.34 MHz, 30 kW

Antenna: horizontal dipole, Azimuth 65 - 245 o (WSW - ENE)
Receiver: Spectrum Communications 70 MHz to 144 MHz transverter feeding a Yaesu FT290-R, band pass 20 kHz.
Observing method: the squelch circuit in the receiver is sampled by an Acorn BBC model B microcomputer.

Counts of events during one hour bins starting at UT:

```
| July 1994
UT | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
-----------------------------------------------------------------
0 | 11 10 10 11 1 6 4 2 30 - - - 5 5 4 5
1 | 7 13 8 19 1 14 4 3 6 - - - 6 5 2 6
```

```
2 | 22 9 1 31 0 16 8 2 6 - - - 4 2 4 27
3 | 12 21 10 25 & 21 13 12 19 - - - 38 3 18 23
4 | 17 41 27 38 5 12 6 6 14 - - - 33 35 20 &
5 | 33 41 24 50 13 26 3 11 19 - - - 23 12 36 17
6 | 62 28 54 30 11 5 12 21 9 - - - 9 10 17 14
7 | 42 57 39 30 20 15 & 15 7 - - - 17 12 12 27
8 | & 39 13 3 11 12 0 8 11 - - - 21 & & 13
9 | 46 35 - 15 6 7 2 28 22 - - - 17 5 23 16
10 | 57 39 - 26 7 22 5 11 16 - - - 23 & 3 16
11 | 32 33 - 31 8 7 20 9 12 - - - 22 & 14 6
12 | 21 28 - 27 18 17 8 10 4 - - - 35 13 14 4
13 | 35 34 - 16 8 11 4 2 12 - - - 3 12 29 10
14 | 30 41 - & 10 14 0 9 - - - - 11 8 8 8
15 | 55 10 - & 8 13 3 8 - - - - 6 5 38 3
16 | 41 & - 14 4 5 3 0 - - - - 27 2 5 1
17 | 9 & - 6 2 15 4 5 - - - - 12 11 5 5
18 | 91 & - 9 2 13 4 3 - - - - 2 6 10 10
19 | 84 & 4 10 0 2 17 5 - - - - 3 5 19 16
20 | 13 & 5 3 9 4 14 14 - - - 11 4 17 0 22
21 | 6 & 9 6 7 8 9 15 - - - 20 9 6 12 13
22 | 7 34 18 4 3 1 5 6 - - - 11 15 5 16 7
23 | 12 15 15 3 7 10 14 8 - - - 10 3 3 20 3
-----------------------------------------------------------------
UT | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

| July 1994
UT | 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
-----------------------------------------------------------------
0 | 8 6 7 9 6 4 2 14 5 7 13 12 16 8 44
1 | 7 12 2 4 5 8 5 4 11 7 15 22 11 7 50
2 | 4 5 7 15 11 6 3 12 9 15 19 14 16 & 25
3 | 8 7 12 6 8 13 4 11 18 64 44 36 41 & &
4 | 11 18 & 12 4 27 26 28 14 24 50 & & & 47
5 | 29 22 & 22 33 32 29 43 23 39 46 81 39 43 46
6 | 19 13 25 43 28 30 38 & 34 21 33 43 40 44 18
7 | 46 17 & 10 12 40 30 40 16 26 26 48 43 30 27
8 | 22 & & 17 7 19 28 54 & 6 11 40 27 25 9
9 | 17 & 23 12 8 11 25 41 35 2 20 19 9 32 -
10 | - & & 13 21 7 30 16 22 0 21 48 & 43 -
11 | - 12 & 10 6 10 26 29 20 0 20 29 67 18 -
12 | - 22 5 17 12 6 25 32 19 24 20 & & 38 -
13 | - 14 15 9 7 14 10 15 18 49 29 16 & 14 -
14 | - & 34 7 8 6 8 8 19 14 17 46 13 28 -
15 | - & 24 6 6 7 5 6 13 15 12 24 8 11 -
16 | - & & 8 5 6 6 12 5 11 14 29 13 12 -
17 | - & 8 5 3 10 15 23 6 10 5 9 3 11 -
18 | - & 22 3 17 4 8 8 2 12 62 17 6 28 -
19 | - 25 2 & & 7 4 6 1 15 19 9 11 38 -
20 | - 6 6 & & 4 12 10 3 & 8 & 40 40 -
21 | 6 13 2 3 21 20 11 18 13 & 34 30 23 34 28
```

```
22 | 12 11 15 9 21 9 10 13 20 24 25 30 33 27 41
23 | 9 13 14 6 26 20 27 12 13 20 49 21 & 44 44
-----------------------------------------------------------
UT | 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

| Aug 1994
UT | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
-----------------------------------------------------------------------
0 | 36 25 22 3 5 8 29 15 7 43 31 22 116 72 5 24
1 | 16 31 17 6 9 8 5 7 3 15 20 19 50 83 15 14
2 | 40 33 12 4 10 8 20 4 6 14 9 22 36 1 8 5
3 | 25 73 54 10 27 14 27 23 23 13 30 37 53 5 66 21
4 | 49 104 53 14 & 27 24 19 41 26 50 101*102 95 44 43
5 | 58 57 76 12 28 17 47 25 41 49 30 72* 96 58 23 22
6 | 51 26 32 23 36 22 7 25 39 15 41 77* 55 85 26 21
7 | 56 86 29 12 27 28 20 5 26 35 11 162* 82 62 48 30
8 | 46 40 72 6 49 25 19 1 38 10 42 108* 57 78 & 42
9 | 14 35 30 10 27 22 19 - 67 0 14 84* 78 28 52 24
10 | 23 37 40 13 22 19 17 - 36 16 25 - 103 31 66 22
11 | 8 15 35 19 27 14 29 4 15 21 83 - 113 46 46 52
12 | 2 51 41 16 19 15 27 11 29 21 29 - 147 67 17 65
13 | 21 58 41 5 44 7 24 16 24 38 32 - 45 50 16 35
14 | 21 29 23 77 0 4 16 19 39 16 29 49* & 25 43 23
15 | 39 18 70 2 16 22 83 18 32 13 16 114* & 13 19 4
16 | 8 4 33 10 6 23 3 18 29 19 22 52* 21 22 14 20
17 | 14 14 27 50 11 5 21 6 28 33 11 112* 59 4 17 10
18 | 34 47 18 5 8 14 15 17 35 10 3 39 21 46 11 8
19 | 28 5 13 10 12 15 20 25 27 9 26 101 33 35 21 18
20 | 14 15 25 28 12 16 8 40 25 20 25 68 14 30 10 14
21 | 23 9 11 14 24 15 30 44 44 21 44 65 62 48 24 18
22 | 21 22 28 29 28 46 22 16 26 28 48 68 44 42 22 15
23 | 33 34 33 49 17 14 77 62 32 61 69 82 62 44 30 28
-----------------------------------------------------------------------
UT | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

| Aug 1994
UT | 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
-------------------------------------------------------------
0 | 25 27 7 8 23 2 6 7 3 7 8 38 33 43 20
1 | 9 8 11 15 15 11 7 16 4 9 8 11 4 8 8
2 | 18 12 18 17 6 12 14 10 26 17 7 22 19 13 20
3 | 50 15 21 14 12 16 11 22 50 15 33 10 21 34 23
4 | 61 38 38 39 31 39 39 25 38 60 26 49 34 38 25
5 | 21 42 31 51 50 23 43 21 60 34 34 33 35 20 26
6 | 24 45 43 48 84 34 18 21 19 41 30 54 29 36 28
7 | 17 21 34 42 31 28 18 22 24 41 39 40 44 22 22
8 | 43 - 33 21 43 23 7 34 57 42 48 31 32 35 9
9 | 29 - 41 37 24 29 2 44 45 52 35 - 22 21 17
10 | 29 - 45 18 41 24 28 31 26 27 29 - 21 20 39
11 | 23 - 36 20 38 23 2 38 24 21 17 - 13 32 15
12 | 16 - 24 34 37 18 8 21 21 37 16 - 20 19 6
```

```
13 | 21 - 32 11 17 17 1 16 11 23 21 16 22 8 7
14 | 10 - 47 14 35 7 10 3 15 28 23 41 14 8 8
15 | 9 - 8 17 16 12 2 11 8 13 11 8 16 3 12
16 | 24 - 4 23 13 21 2 10 8 15 7 3 13 3 2
17 | 10 - 24 21 7 20 4 12 10 4 5 11 7 14 6
18 | 9 - 6 9 5 8 19 13 8 11 14 15 4 2 8
19 | 32 - 11 14 9 3 10 13 7 13 15 26 6 17 9
20 | 28 - 10 10 12 3 8 7 11 9 35 3 15 8 2
21 | 13 10 17 11 14 17 32 16 19 30 9 10 22 4 9
22 | 23 40 42 26 20 23 50 18 24 26 22 13 22 28 19
23 | 48 20 32 28 20 40 21 26 23 18 34 27 31 21 17
-------------------------------------------------------------
UT | 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
```

. & : affected by direct reception.
The criterion used: average duration during the hour > 1 s.

. * High Perseid activity on Aug 12 between 4 and 17 h UT (unfortunately
no observations between 10-12 h UT, when the anomalous peak took place).

R. Stapleton / C. Steyaert

Observer: George J. Zay
Location: Descanso, California, USA (116 38' W, 32 50' N)
Height above sealevel: 1003 m
Frequency: 92.90 MHz
Transmitter Location: Flagstaff, Arizona Distance: 538 Km
Transmitter Power: 100 kW; 24h/day and 7 days a week
Antenna: 6 element Yagi, Azimuth 60 o, Elevation 45 o
Receiver: JVC RX-302BK Digital Receiver
Observing method: Listening

Raw counts of reflections during one hour interval starting at UT:

```
June |
1994 | 05h 06 07 08 09 10 11 12
-----------------------------------------------
20 | 18 23 21 22 44 33 46 24&
22 | 17 24 17 31 38 - - -
-----------------------------------------------
| 05h 06 07 08 09 10 11 12
```

```
July |
1994 | 04h 05 06 07 08 09 10 11 12
-----------------------------------------------------
2 | - 07 22 15 40 25 29 28 24&
3 | - 13 22 21 28 35 34 34 28
28 | 12 27 52 62 90 30& - - -
-----------------------------------------------------
| 04h 05 06 07 08 09 10 11 12
```

```
Aug |
1994 | 03h 04 05 06 07 08 09 10 11 12
-------------------------------------------------------
7 | - 16 19 35 16& - - - 29* 43
9 | 06 20 34 35 64 63 27& - - -
10 | 08 09& - - - - - - - -
13 | 08 06 21 19 30 59 48 42 44 -
14 | 09 10 06 10 25 28 11& 16 20 -
-------------------------------------------------------
| 03h 04 05 06 07 08 09 10 11 12
```

& : first 30 minutes of the interval
* : last 30 minutes of the interval

George J. Zay / reported by Jeroen Van Wassenhove

2. ABOUT THE RMOB

The RMOB is an independent initiative of some workers in the field of radio meteor scatter observations and data reduction. It started in August 1993 in order to spread rapidly the Perseid results via E-mail. Since then, it has appeared monthly, and has gradually been expanded.

Typically it contains: summaries of recent observations, first results of stream activity by radio methods, relations between radio and optical meteors, references to other publications in the field of meteor astronomy and radio scatter techniques, announcements of meetings, short questions and answers, non-commercial (second hand) sale of radio equipment, available software.

Contributors are mentioned, and interested persons are asked to contact them directly.

RMOB can be copied freely in unabridged and unmodified form. Extracts should indicate the source (Radio Meteor Obs Bulletin, month and year).

If you want to subscribe (or unsubscribe) to the E-mail distribution list, please send a message to C. Steyaert.
Those not having access to E-mail can obtain a printed copy free of charge from J. Van Wassenhove (current or back-issues).

3. CONTRIBUTORS / USEFUL ADDRESSES

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George J. Zay
3946 Paula Street
La Mesa, CA 91941, U.S.A.
--
Christian Steyaert (RMOB9409) 8 October 1994
--

1655. STS-68 Orbital State Vector Rev #118

Newsgroup: rec.radio.amateur.space
Date: 1994-10-08 22:09:07 UTC
From: astroman@netcom.com
Message-ID: <astromanCxDK78.H4B@netcom.com>
Source record: 26760
Cross-posted to: sci.space.shuttle,rec.radio.amateur.space,rec.radio.info

```
Vector format = 1017
Satellite Name: STS-68
Catalog Number: 23285 94062A
Epoch Date/Time: 94280.68261223380
10/07/1994 16:22:57.697 UTC
ECI X: 15020015.927823 ft
M50 Y: 15437410.467789 ft
Z: 1689711.547567 ft
Xdot: -11119.25391 ft/s
Ydot: 8476.57812 ft/s
Zdot: 21367.92578 ft/s
ndot/2 (drag): 0.00258400083 rev/day^2
nddt/6: 2.73900E-07 rev/day^3
Bstar: 8.59739E-05 1/Earth Radii
Elset #: 15
Rev @ Epoch: 118.01546193727

MSDOS/PC software is available for conversion of
OSV to 2 Line Keplerian Elements via ftp to:
oak.oakland.edu:/pub/msdos/hamradio/v2l9331.zip
and the SIMTEL archives.

State Vectors courtesy Ken Ernandes N2WWD

SM
```

1656. Re: Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-09 00:07:44 UTC
From: anto@gate.net
Message-ID: <377c8h$j13@tequesta.gate.net>
Source record: 26759

Art Jeyes (art_jeyes@jhuapl.edu) wrote:
: Hi.... I am new to rec.radio.amateur.space and am just thinking about
: getting active in Sat comms....

: Could someone explain the phase schedules I have seen for some of the sat
: modes .... (I understand the modes Mode B, S etc) just not the phasing..

: for example ... what does MA 20 to MA 50 mean ...

MA stands for mean anomaly. It is a number between 0 and 256. It is used to locate the satellite in it's orbit. For example, MA 0 means the satellite is at perigee (point where satellite height is minimum). At MA 128, the satellite is at apogee (point in orbit where satellite height is maximum). With MA between 0 and 128, the satellite is headed toward apogee. Likewise, if MA is between 128 and 256, the satellite is headed toward perigee. Note that MA 0 and 256 refer to the same point, perigee.

The MA is frequently used to indicate when transponders will be turned on and off during any orbit.

: Thanks... Art Jeyes
: AA3GU
: Art.Jeyes@jhuapl.edu
: AA3GU@W3ZH.MD.USA

--
Nigel Kirlew, N4TKC
anto@gate.net

1657. Webersat reception

Newsgroup: rec.radio.amateur.space
Date: 1994-10-09 18:10:29 UTC
From: tsmithers@cix.compulink.co.uk
Message-ID: <CxF3tI.LuJ@cix.compulink.co.uk>
Source record: 26611

Are there any experts out there who regularly receive Webersat AO18 data.
I'm set up to receive AO16 with a PSK-1T & PB and all works ok but when I
try AO18 I have great difficulty in capturing any telm data.
The modem locks but it does'nt matter how carefully I tune I cannot get
any indication from the "con" led.
The same problem occurs using Weberware 1.3 capture. The system works
well with AO16 so the downlink to the PC seems ok.
Any help or advice would be appreciated.

73 Trevor G0KTN / AUK 3475

tsmithers@cix.compulink.co.uk
G0KTN@amsat.org

1658. Ham-Space Digest V94 #274

Newsgroup: rec.radio.amateur.space
Date: 1994-10-09 20:56:36 UTC
From: 100407.436@compuserve.COM
Message-ID: <941009205635_100407.436_BHA34-2@CompuServe.COM>
Source record: 26612

:IF you were under the FCC's jurisdiction then whoever the REF is lied to you.
:You have every "right" to use RS-10, as long as you adhere to the limitations
:of your license class for transmissions leaving your antenna. If RS-10 chooses

:to retransmit your signals, that is RS-10's control operator's problem, not
:yours.

Not at all.. Here in France the law is not the same. By example, some
"beginners" licenses (FA...) do not allow to transmit on UHF, but only on VHF..
So the FA.. can not use any cross-band repeater that would re-transmit them on
UHF.
In fact the problem is harder: What should we think about packet, that forward
the message of a FA by example, on UHF, SHF, HF bands ?? Of course it would be
stupid not to allow packet to them because of this.. Some exeptions exists, and
RS10/11 is one of them.

1659. EME'ers in Seattle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-09 21:30:06 UTC
From: edsuom@u.washington.edu
Message-ID: <379ncu$m47@nntp1.u.washington.edu>
Source record: 26613

Could anyone tell me the names and calls of active moonbouncers in the Seattle area? I've been mildly interested in this aspect of the hobby for years and would love to see some setups.

Please E-mail directly:

Ed Suominen NM7T
edsuom@u.washington.edu

1660. Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-09 22:08:57 UTC
From: dmgillah@mtu.EDU
Message-ID: <199410092208.SAA08408@mtu.edu>
Source record: 26614

Speaking of Phase schedules, I was wondering where I might find current
ones? The sat I'm most interested in is AO-13, but schedules for others
would be good too...Thanks
--
****
* Talk to ya, Dave Attention all Skydivers: *
* Until you've jumped *
* Michigan Technological University into pitch blackness *
* Where it's too &@#% cold! at 1250 feet with 80 *
* dmgillah@mtu.edu pounds of combat gear, *
* kb8por@w8yy.#upmi.mi.usa.na YOUR STILL A LEG !!! *
****

1661. Re: Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-10 01:16:52 UTC
From: anto@gate.net
Message-ID: <37a4m4$58o@tequesta.gate.net>
Source record: 26615

Nigel Kirlew (anto@gate.net) wrote:

: Art Jeyes (art_jeyes@jhuapl.edu) wrote:
: : Hi.... I am new to rec.radio.amateur.space and am just thinking about
: : getting active in Sat comms....

: : Could someone explain the phase schedules I have seen for some of the sat
: : modes .... (I understand the modes Mode B, S etc) just not the phasing..

: : for example ... what does MA 20 to MA 50 mean ...

: MA stands for mean anomaly. It is a number between 0 and 256. It is used to
^^^^^^^^^
Let me add a clarification since from e-mail received there is some misunderstanding. Mean anomaly (angle), when used for satellite tracking purposes, has values from 0 to 360. The mean anomaly is 0 at perigee and 180 at apogee. Values between 0 and 180 mean the satellite is headed toward apogee, values between 180 and 360 mean the satellite is headed toward perigee. However, MA is used in a somewhat different sense by the radio amateur Phase 3 satellite designers when refering to phase units. When MA is used to represent phase units, it has a range from 0 to 256. This was more convenient for the designers because of the microprocessor architecture used in the satellites. There is a direct relationship between phase units and "traditional" mean anomaly. To convert to phase units from traditional mean anomaly use:

Phase Unit = 256/360 * Mean Anomaly

I hope this helps to clarify the meaning.

: locate the satellite in it's orbit. For example, MA 0 means the satellite is
: at perigee (point where satellite height is minimum). At MA 128, the
: satellite is at apogee (point in orbit where satellite height is maximum).
: With MA between 0 and 128, the satellite is headed toward apogee. Likewise,
: if MA is between 128 and 256, the satellite is headed toward perigee. Note
: that MA 0 and 256 refer to the same point, perigee.

: The MA is frequently used to indicate when transponders will be turned on
: and off during any orbit.

--
Nigel Kirlew, N4TKC
anto@gate.net

1662. Re: GPS Info?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-10 10:53:09 UTC
From: phufh@csv.warwick.ac.uk
Message-ID: <37b6el$a2p@edam.csv.warwick.ac.uk>
Source record: 26616

Silva (the quality compass manufactures) also manufacture a GPS receiver incorporating an electronic compass. This means that in addition to telling you which direction to travel, it will show you!

Can't recall there address, mail me if need it.

Andy

Andrew David Lambert	phufh@csv.warwick.ac.uk	"I don't like it and I'm sorry
3rd Year Physics	g7jaf	I've had anything to do with
University of Warwick		it.".....Quantum Mechanics
England_____	_____	ERWIN SCHRODINGER 1887-1961___

1663. HELP!!! Any Way to Record Digital "Unattended"?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-10 12:02:31 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <37bagnINNdsd@gulfaero.com>
Source record: 26617

I am trying to record unattended data from my icom while I am at work, but regular audio tape does not give me the resolution I need. Either DAT or minidisk was recommended. However, I cannot keep my computer on all day to control the recorder due to afternoon lightening storms. If you have been able to record unattended signals on a digital format, please let me know the secret.

In advance->Thank you very much!!

Ken
ken_terry@macmail.eng.gulfaero.com

1664. Re: Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-10 12:40:14 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Oct10.124014.26875@ke4zv.atl.ga.us>
Source record: 26618

In article <37a4m4$58o@tequesta.gate.net> anto@gate.net (Nigel Kirlew) writes:
>Nigel Kirlew (anto@gate.net) wrote:
>: MA stands for mean anomaly. It is a number between 0 and 256. It is used to
> ^^^^^^^^^
>Let me add a clarification since from e-mail received there is some
>misunderstanding. Mean anomaly (angle), when used for satellite tracking
>purposes, has values from 0 to 360. The mean anomaly is 0 at perigee and 180
>at apogee. Values between 0 and 180 mean the satellite is headed toward
>apogee, values between 180 and 360 mean the satellite is headed toward
>perigee. However, MA is used in a somewhat different sense by the radio
>amateur Phase 3 satellite designers when refering to phase units. When MA is
>used to represent phase units, it has a range from 0 to 256. This was more
>convenient for the designers because of the microprocessor architecture
>used in the satellites. There is a direct relationship between phase
>units and "traditional" mean anomaly. To convert to phase units from
>traditional mean anomaly use:
>
> Phase Unit = 256/360 * Mean Anomaly
>
>I hope this helps to clarify the meaning.

Yes, except for one ittsy bittsy detail. MA is from 0 to *255*, the
largest decimal number expressable in 8 bits. That's 256 *counts*
including zero.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1665. Re: EME'ers in Seattle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-10 14:15:02 UTC
From: vaughnwt@olympus.net
Message-ID: <vaughnwt.60.000E409C@olympus.net>
Source record: 26621

In article <379ncu$m47@nntp1.u.washington.edu> edsuom@u.washington.edu (Ed Suominen) writes:
>From: edsuom@u.washington.edu (Ed Suominen)
>Subject: EME'ers in Seattle
>Date: 9 Oct 1994 21:30:06 GMT

>Could anyone tell me the names and calls of active moonbouncers in the
>Seattle area? I've been mildly interested in this aspect of the hobby for
>years and would love to see some setups.

>Please E-mail directly:

>Ed Suominen NM7T
>edsuom@u.washington.edu

Forget that e-mail directly a lot of us would like to see this.

1666. Phase schedules

Newsgroup: rec.radio.amateur.space
Date: 1994-10-10 19:32:12 UTC
From: courtney_duncan@jpl-335-server.jpl.nasa.gov
Message-ID: <courtney_duncan.1132205172A@llyene.jpl.nasa.gov>
Source record: 26619

Angles can be measured in many units:

circles : perigee 0, apogee 0.5
radians : perigee 0, apogee PI (3.141592653......)
degrees : perigee 0, apogee 180
grads : perigee 0, apogee 200
Meinzers : perigee 0, apogee 128

"Meinzers" were chosen to make the most use of 8 bits in representing the value. As long as you know how to use it correctly, it's just as good as any other unit. To have used integer degrees, you'd have to have a ninth bit, which would be wasted most of the time (much like the fourth bit in BCD), to have used radians, you'd need some kind of float (if you used standards) which is a bunch more bytes. (Radians are better if you're actually calculating trig values as part of the algorithm, which I don't think they do in the Phase III series, I think they just index into a table, another reason to use 0-255 base.)

Note that Mean Anomaly is uniform in time, not angle, so one mean anomaly unit (of any type) corresponds to much larger angle (in "true anomaly") near perigee than at apogee. For circular orbits, mean, true, (and eccentric) anomalies are roughly the same.

Needing a unit to describe 1/256th of a circle, some of the insiders coined the term "Meinzers" several years ago in honor of Dr. Dr. Dr. Karl Meinzer, DJ4ZC, one of the main European leaders in the amateur satellite program dating back to OSCAR 6 days. This is mainly because he made that selection and wrote the P3 software (in a language called IPS, similar to Forth).

Courtney, n5bf

1667. Re: EME'ers in Seattle

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 02:43:04 UTC
From: micron3@aol.com
Message-ID: <37cu3o$gge@newsbf01.news.aol.com>
Source record: 26620

In article <379ncu$m47@nntp1.u.washington.edu>, edsuom@u.washington.edu (Ed Suominen) writes:

>Could anyone tell me the names and calls of active moonbouncers in the >Seattle area? I've been mildly interested in this aspect of the hobby for

>years and would love to see some setups.

Ed,

Listen for Lionel VE7BQH and the 2 Meter EME net on Saturday mornings. I think they would start about 9 or 10AM PDT on a frequency of 14.345 MHz.

If you would like a full listing of EME capable hams call the BBS at (704) 284-4854 (I forget the name). You will fing alot of EME related stuff including the current directory there.

Good Luck,
Terry KJ7F DN-13

1668. AEA DSP-1232 problem

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 02:58:18 UTC
From: rdhoughton@vms4.sci.csupomona.edu
Message-ID: <1994Oct10.195818.1@clstcs>
Source record: 26623

After some initial frustration, I have been able to get the STEP function on my AEA DSP-1232 multi-mode controller to work with modem 13 (Pacsat). Now, my question is this. While waiting to acquire the satellite, that is *before* the DCD light is active, the DSP unit continuously pulses the mic frequency change line. Short of adding a switch in the freq control line is there a way to avoid this. It seems like the STEP function should require the modem to hear a frequency error AND hear a carrier before is starts changing the frequency.

Additionally, when the radio (Yaesu FT-736R) transmits, if a freq stepping pulse arrives during the short time the radio is transmitting, the frequency is changed by 100 Hz since that is the smallest tuning increment while in the FM mode. Since the DSP unit thinks that it has stepped the VFO by 10Hz the modem jumps way off frequency. Does anyone have a workaround for this?

Thanks in advance,

Bob Houghton
KC6LVG

1669. EZSATS Eastern Sat Passes 10/17-10/23

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 06:46:29 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <37dcc5$bml@usenet.INS.CWRU.Edu>
Source record: 26625

```
Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD
BID: $EZE0005
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 07Oct
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 05Oct
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 06Oct
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 07Oct
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 07Oct
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 03Oct

Mon 17 Oct 94
MIR 00:52i 02:27d 04:04h 05:42i 07:19h 08:55b 10:32i 23:58i
OSCAR-21 06:08h 07:50B 09:39I 17:05i 18:49b 20:36H
RS-10/11 05:11i 06:55d 08:41G 18:42h 20:25C 22:15I
RS-12/13 01:43I 09:04g 10:49E 12:38I 20:52i 22:33c
DOVE 02:58h 04:35C 06:18I 15:14i 16:50e 18:30G
AO-27 01:19i 02:52g 04:31F 15:08h 16:46B 18:27I
Tue 18 Oct 94
MIR 01:31d 03:08h 04:46i 06:23i 07:59f 09:36h
OSCAR-21 06:34g 08:18E 10:10I 17:32g 19:17D 21:05I
RS-10/11 05:40h 07:25B 09:12I 17:33i 19:10f 20:56F 22:50I
RS-12/13 00:20H 07:48i 09:32e 11:18G 21:18h 23:01C
DOVE 02:31i 04:06d 05:47H 16:21g 18:00F 19:42I
AO-27 02:26h 04:04C 05:47I 14:42i 16:19d 18:00H
Wed 19 Oct 94
MIR 00:36g 02:12f 03:50i 05:28i 07:04g 08:40e 10:18i 23:41h
OSCAR-21 05:21i 07:01d 08:47G 16:16i 17:59f 19:45G
RS-10/11 04:29I 06:10g 07:55F 09:45I 17:58i 19:40b 21:28H
RS-12/13 00:50I 08:15h 10:00A 11:47H 21:44f 23:30F
DOVE 02:05i 03:38f 05:17G 15:53h 17:31C 19:12I
AO-27 02:00i 03:37b 05:19H 15:53f 17:33G 19:16I
Thr 20 Oct 94
MIR 01:16c 02:54h 04:32i 06:09h 07:45c 09:22i 22:48i
OSCAR-21 05:46h 07:28B 09:17H 16:43i 18:27b 20:13H
RS-10/11 04:56i 06:40d 08:26H 18:26h 20:10D 22:00I
RS-12/13 01:22I 08:43g 10:28E 12:17I 20:31i 22:12d 23:59H
DOVE 03:10h 04:48D 06:31I 15:25i 17:02d 18:42H
AO-27 01:36i 03:11e 04:51G 15:27h 17:06D 18:47I
Fri 21 Oct 94
MIR 00:21d 01:58h 03:36i 05:13i 06:49f 08:26h 23:26g
OSCAR-21 06:12g 07:56E 09:48I 17:09h 18:55D 20:43I
RS-10/11 05:25h 07:10B 08:57I 17:17i 18:55f 20:41G 22:37I
RS-12/13 07:28i 09:11e 10:57G 20:57h 22:40C
DOVE 02:42i 04:19b 06:00H 16:33g 18:13G 19:56I
```

AO-27 02:44g 04:23F 06:10I 15:01i 16:39a 18:20H
Sat 22 Oct 94
MIR 01:02f 02:40i 04:17i 05:54g 07:30e 09:08i 22:31h
OSCAR-21 04:59i 06:38e 08:25G 15:54i 17:37f 19:23G
RS-10/11 04:12i 05:54f 07:40F 09:31I 17:42i 19:24b 21:13H
RS-12/13 00:29I 07:54h 09:39B 11:26H 21:24f 23:09F
DOVE 02:15i 03:50f 05:30G 16:05h 17:43D 19:25I
AO-27 02:19h 03:56C 05:40I 14:36i 16:12e 17:52H
Sun 23 Oct 94
MIR 00:06c 01:43h 03:21i 04:58h 06:34b 08:11i 21:37i 23:10d
OSCAR-21 05:23h 07:06A 08:54H 16:20i 18:04b 19:51H
RS-10/11 04:40i 06:24c 08:11H 18:10g 19:55D 21:45I
RS-12/13 01:01I 08:22g 10:07E 11:56I 20:10i 21:51d 23:38H
DOVE 03:21g 05:00E 06:45I 15:37i 17:14b 18:55H
AO-27 01:54i 03:30c 05:11H 15:46g 17:25F 19:08I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

These satellites can be received with 2-meter or HF rigs. All times are
for the start of the pass. An average pass is 10-15 minutes long. For late
breaking news, listen to the EZSATS feature on `This Week in Amateur Radio',
Saturdays at 6:30 PM CDT on Galaxy 3, transponder 17, 5.8 MHz audio. Please
ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1670. EZSAT Eastern sat passes 10/24-10/30

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 06:48:13 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <37dcfd$boe@usenet.INS.CWRU.Edu>
Source record: 26626

```
Easy Sats East - Eastern US Satellite UTC Pass Times de N9LTD
BID: $EZE0006
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 07Oct
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 05Oct
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 06Oct
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 07Oct
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 07Oct
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 03Oct

Mon 24 Oct 94
MIR 00:47h 02:25i 04:02i 05:39f 07:15h 22:15g 23:51f
OSCAR-21 05:49g 07:34E 09:25I 16:47h 18:32D 20:20I
RS-10/11 05:09h 06:54C 08:42I 17:00i 18:39e 20:26G
RS-12/13 07:07i 08:50e 10:36G 20:36h 22:19C
DOVE 02:54h 04:31A 06:13I 15:10i 16:45f 18:25G
AO-27 01:29i 03:03f 04:43G 15:19h 16:58D 18:40I
Tue 25 Oct 94
MIR 01:29i 03:07i 04:43g 06:19e 07:57i 21:20h 22:55c
OSCAR-21 04:37i 06:16e 08:02G 15:32i 17:14f 19:00G
RS-10/11 03:56i 05:39f 07:25F 17:27h 19:09b 20:57H
RS-12/13 00:09I 07:34h 09:18b 11:05H 21:03f 22:48F
DOVE 02:27i 04:02d 05:42H 16:17g 17:56E 19:37I
AO-27 02:37g 04:16E 06:01I 14:54i 16:32b 18:12H
Wed 26 Oct 94
MIR 00:33h 02:11i 03:47h 05:24c 07:00i 20:26i 22:00e 23:36h
OSCAR-21 05:01h 06:43A 08:32H 15:58i 17:42c 19:29H
RS-10/11 04:24i 06:09c 07:55H 17:55g 19:39E 21:31I
RS-12/13 00:41I 08:01g 09:47E 11:35I 19:50i 21:30d 23:17H
DOVE 02:01i 03:33g 05:12F 15:48i 17:27B 19:07I
AO-27 02:12h 03:49B 05:32I 14:29i 16:05e 17:45G
Thr 27 Oct 94
MIR 01:14i 02:52i 04:28f 06:04h 21:04g 22:40f
OSCAR-21 05:27g 07:11E 09:02I 16:25h 18:10D 19:58I
RS-10/11 04:54h 06:39D 08:27I 16:44i 18:24e 20:10G
RS-12/13 06:46i 08:29e 10:15G 20:15h 21:59B 23:48I
DOVE 03:05h 04:43C 06:26I 15:21i 16:58d 18:38H
AO-27 01:47i 03:23d 05:03H 15:39g 17:18F 19:00I
Fri 28 Oct 94
MIR 00:18i 01:56i 03:32g 05:08e 06:47i 20:09h 21:44c 23:22h
OSCAR-21 04:14i 05:54e 07:40G 15:10i 16:52f 18:38G
RS-10/11 03:40i 05:23f 07:09G 17:11h 18:54A 20:42H
RS-12/13 07:13h 08:57A 10:44H 20:42f 22:27F
DOVE 02:38i 04:14c 05:55H 16:29g 18:08F 19:51I
```

AO-27 01:23i 02:56f 04:36G 15:12h 16:51B 18:32I
Sat 29 Oct 94
MIR 01:00i 02:37h 04:13d 05:50i 19:15i 20:49e 22:25h
OSCAR-21 04:39h 06:21B 08:09H 15:36i 17:20c 19:06H
RS-10/11 04:09i 05:53b 07:40H 17:39g 19:24E 21:16I
RS-12/13 00:20I 07:40g 09:26E 11:14I 19:29i 21:10d 22:57H
DOVE 02:11i 03:45f 05:25G 16:00h 17:39C 19:20I
AO-27 02:30h 04:09D 05:53I 14:47i 16:24d 18:05H
Sun 30 Oct 94
MIR 00:03i 01:41i 03:17f 04:53h 19:53g 21:29f 23:07i
OSCAR-21 05:05g 06:49E 08:40I 16:02h 17:47C 19:35I
RS-10/11 04:38g 06:24D 08:12I 16:28i 18:08d 19:55G
RS-12/13 06:25i 08:08e 09:54G 19:55h 21:38B 23:27I
DOVE 03:17h 04:55E 06:40I 15:32i 17:10c 18:50H
AO-27 02:05i 03:42a 05:24I 15:58f 17:38G 19:21I

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1671. EZSATS Western passes 10/17-10/23

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 06:48:22 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <37dcfm$bpm@usenet.INS.CWRU.Edu>
Source record: 26627

```
Easy Sats West - Western US Satellite UTC Pass Times de N9LTD
BID: $EZW0005
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 07Oct
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 05Oct
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 06Oct
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 07Oct
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 07Oct
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 03Oct

Mon 17 Oct 94
MIR 02:25h 04:00d 05:37h 07:15i 08:52g 10:28e 12:05i
OSCAR-21 07:52g 09:36E 11:27I 18:49h 20:34D 22:21I
RS-10/11 06:55h 08:40A 10:27H 20:26f 22:11F
RS-12/13 01:37G 09:05i 10:48e 12:34G 22:35h
DOVE 04:38g 06:16E 08:02I 16:52i 18:30b 20:10H
AO-27 02:57i 04:32e 06:13H 16:47h 18:26E 20:08I
Tue 18 Oct 94
MIR 01:31i 03:04d 04:41h 06:19i 07:56h 09:32c 11:09h
OSCAR-21 06:39i 08:18e 10:05G 17:33i 19:16f 21:02F
RS-10/11 00:04I 05:44I 07:24g 09:10E 10:59I 19:14i 20:56c 22:43H
RS-12/13 00:18B 02:07H 09:32h 11:16b 13:03H 23:02g
DOVE 04:10h 05:47B 07:30I 16:25i 18:01f 19:41G 21:24I
AO-27 02:33i 04:06g 05:45F 07:32I 16:21i 18:00A 19:40H
Wed 19 Oct 94
MIR 00:38i 02:09g 03:45g 05:23h 07:01h 08:37f 10:13g
OSCAR-21 07:04h 08:46a 10:34H 17:59i 19:44c 21:30H
RS-10/11 06:10i 07:54d 09:41G 19:42h 21:26C 23:15I
RS-12/13 00:47E 02:38I 09:59g 11:45D 13:33I 21:49i 23:29d
DOVE 03:43i 05:18d 06:59H 17:32h 19:11E 20:53I
AO-27 03:40h 05:18C 07:01I 15:56i 17:33d 19:13H
Thr 20 Oct 94
MIR 01:14h 02:50d 04:27h 06:05i 07:41g 09:18e 10:55i
OSCAR-21 07:29g 09:14E 11:04I 18:26h 20:11C 21:59I
RS-10/11 06:39h 08:24A 10:11H 18:33i 20:11f 21:56F 23:49I
RS-12/13 01:16G 08:44i 10:27e 12:13G 22:14h 23:57B
DOVE 03:16i 04:50g 06:29F 17:04i 18:42B 20:23H
AO-27 03:15i 04:51c 06:33H 17:06g 18:46F 20:28I
Fri 21 Oct 94
MIR 00:20i 01:54c 03:31h 05:09i 06:46h 08:22c 09:59h 23:28i
OSCAR-21 06:17i 07:56e 09:42G 17:11i 18:54f 20:39F
RS-10/11 05:27i 07:09g 08:55E 10:44I 18:59i 20:40c 22:28H
RS-12/13 01:46H 09:11h 10:55a 12:42H 22:41g
DOVE 04:22h 05:59D 07:43I 16:36i 18:13e 19:53H
```

AO-27 02:50i 04:25e 06:05G 16:40h 18:19D 20:00I
Sat 22 Oct 94
MIR 00:59g 02:35g 04:13h 05:50h 07:26f 09:03g
OSCAR-21 06:41h 08:23a 10:11H 17:37i 19:21c 21:08H
RS-10/11 05:55i 07:39d 09:25G 19:26h 21:10D 23:00I
RS-12/13 00:26E 02:17I 09:38g 11:24D 13:12I 21:28i 23:08d
DOVE 03:54i 05:30c 07:12H 17:44g 19:24F 21:06I
AO-27 02:27I 03:59g 05:38E 07:23I 16:14i 17:52b 19:33H
Sun 23 Oct 94
MIR 00:04h 01:39d 03:17h 04:54i 06:31g 08:07d 09:45i 23:10i
OSCAR-21 07:07g 08:51E 10:42I 18:04h 19:49C 21:36I
RS-10/11 06:24h 08:09B 09:56I 18:17i 19:55f 21:41F 23:34I
RS-12/13 00:55G 08:23i 10:06e 11:52G 21:54h 23:36A
DOVE 03:27i 05:02f 06:41G 17:16h 18:54C 20:35I
AO-27 03:33h 05:11B 06:54I 15:49i 17:26e 19:06G

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1672. EZSATS Western passes 10/24-10/30

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 06:49:18 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <37dche$bpq@usenet.INS.CWRU.Edu>
Source record: 26628

```
Easy Sats West - Western US Satellite UTC Pass Times de N9LTD
BID: $EZW0006
Sat Name Downlink Signals and Frequencies Date of Elements
MIR FM Voice and Packet 145.550 MHz 07Oct
OSCAR-21 *FM Voice Repeater, Packet Telemetry, WEFAX Pics 145.987 MHz 05Oct
RS-10/11 *CW/SSB 29.360-29.400 MHz Beacons:29.357 + 29.403 MHz 06Oct
RS-12/13 *CW/SSB 29.410-29.450 MHz Beacons:29.407 + 29.453 MHz 07Oct
DOVE *Standard 1200 baud Packet telemetry & messages 145.825 MHz 07Oct
AO-27 *OCCASIONAL FM RPTR! Input: 145.850 Output: 436.800 MHZ 03Oct

Mon 24 Oct 94
MIR 00:44d 02:21h 03:58i 05:35h 07:11c 08:48h 22:17i 23:48g
OSCAR-21 05:55i 07:34e 09:20G 11:15I 16:49i 18:31f 20:17F 22:08I
RS-10/11 05:11i 06:54f 08:39F 10:29I 18:43i 20:25b 22:12H
RS-12/13 01:25H 08:50h 10:35a 12:21H 22:20g
DOVE 04:33g 06:12E 07:56I 16:48i 18:25c 20:06H
AO-27 03:08i 04:44c 06:25H 16:59g 18:39F 20:20I
Tue 25 Oct 94
MIR 01:24g 03:02h 04:40h 06:16f 07:52g 22:53h
OSCAR-21 06:19i 08:01b 09:49H 17:15i 18:59c 20:45H
RS-10/11 05:39i 07:23c 09:10H 19:11g 20:55D 22:45I
RS-12/13 00:05E 01:56I 09:18g 11:03D 12:51I 21:07i 22:48d
DOVE 04:06h 05:43A 07:25I 16:22I 17:56f 19:36G 21:19I
AO-27 02:43i 04:18f 05:58G 16:33h 18:12C 19:53I
Wed 26 Oct 94
MIR 00:29e 02:06h 03:44i 05:20g 06:56e 08:34i 21:59i 23:33c
OSCAR-21 06:45g 08:29D 10:19I 17:42h 19:27C 21:14I
RS-10/11 06:08h 07:54C 09:41I 18:01i 19:40e 21:26G 23:20I
RS-12/13 00:34G 08:02i 09:46e 11:32G 21:33h 23:16A
DOVE 03:38i 05:14e 06:54H 17:28h 19:07E 20:48I
AO-27 03:52g 05:30E 07:15I 16:07i 17:45c 19:25H
Thr 27 Oct 94
MIR 01:10h 02:48i 04:24h 06:01d 07:37h 21:06i 22:37g
OSCAR-21 05:33i 07:12f 08:57G 10:52I 16:26i 18:09f 19:55F 21:45I
RS-10/11 04:55i 06:38f 08:24F 10:14I 18:27i 20:09b 21:57H
RS-12/13 01:04H 08:29h 10:14a 12:00H 22:00g 23:44E
DOVE 03:12i 04:45g 06:24F 08:11I 16:59i 18:38b 20:18H
AO-27 03:26h 05:03B 06:46I 15:43i 17:18f 18:58G 20:41I
Fri 28 Oct 94
MIR 00:14g 01:51h 03:29h 05:05f 06:41g 21:42h 23:18e
OSCAR-21 05:57i 07:39b 09:27H 16:52i 18:36c 20:23H
RS-10/11 05:24i 07:08c 08:55H 18:55g 20:39E 22:30I
RS-12/13 01:36I 08:57g 10:42D 12:30I 20:47i 22:27d
DOVE 04:17h 05:55C 07:38I 16:32i 18:09e 19:48G
```

AO-27 03:01i 04:37d 06:18H 16:52g 18:31E 20:13I
Sat 29 Oct 94
MIR 00:55h 02:33i 04:09g 05:45e 07:23i 20:48i 22:22c 23:59h
OSCAR-21 06:23g 08:07D 09:57I 17:19h 19:04C 20:52I
RS-10/11 05:53h 07:38C 09:26I 17:44i 19:24e 21:10G
RS-12/13 00:14G 07:41i 09:25e 11:11G 21:12h 22:55B
DOVE 03:50i 05:26c 07:07H 17:40g 19:19F 21:01I
AO-27 02:37i 04:11f 05:50F 16:26h 18:04B 19:45I
Sun 30 Oct 94
MIR 01:37i 03:13h 04:50d 06:26h 19:55i 21:26g 23:03g
OSCAR-21 05:11i 06:49f 08:35G 10:29I 16:04i 17:47f 19:32F 21:22I
RS-10/11 04:39i 06:23f 08:09F 18:11h 19:54A 21:42H
RS-12/13 00:44H 08:08h 09:53b 11:40H 21:39g 23:24E
DOVE 03:23i 04:57f 06:37G 17:11h 18:50B 20:31I
AO-27 03:45h 05:23D 07:07I 16:00i 17:38d 19:18H

* Polar orbits: lower case letters mean the pass is to east, upper to west
Maximum altitude above horizon: a=81-90 b=71-80 c=61-70 d=51-60 e=41-50
f=31-40 g=21-30 h=11-20 i=01-10 degrees

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ask your local repeater owners to carry TWAR. For more info:
DJMULLEN@FACSTAFF.WISC.EDU or (608) 249-7130 (BBS)

1673. WINSAT AMSAT Software Question

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 13:40:36 UTC
From: sem2r@galen.med.Virginia.EDU
Message-ID: <CxIGno.GCp@murdoch.acc.Virginia.EDU>
Source record: 26622

I just purchased AMSAT's WINSAT satellite tracking software.
The graphics are beautiful, but I can't get the package to do
two important things. First, I don't see how you can add new
satellites (orbital coordinates can be updated for the pre-loaded
satellites, but many are not included). Second, although the
package gives you current satellite locations, I can't see how
to have it plot several days' worth of alt-azi coordinates so
that one can determine the best "windows of opportunity."
Knowing where a satellite is at any given moment is nice but
knowing when it will be where you want it is a lot more
important. Ideally, one should be able to set requirements
(ie. alt >30 deg) and have the program tell you when these will
be met. Am I missing something here or is this a primitive
(first generation) program?

Please E-mail to: sem2r@galen.med.virginia.edu
Thanks, Stacey E. (Chuck) Mills / WB4QKT

1674. What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 17:59:44 UTC
From: Gary_Rogers@DGC.ceo.dg.COM
Message-ID: <9410111859.AF00021@rtp41.rtp.dg.com>
Source record: 26624

Message:
Reading through the Kep lists, I keep seeing satellites that are unknown to me. In the list group "OSCAR", I see UO-11. In the list group "Micros", I see UO-14 and 22828. Under the list group "Misc.", I see POSAT and GRO. I know these last two aren't amateur satellites, but I curious anyway. Can anyone shed some light on these? If the first three are active, what are the up- and down-link frequencies and the operational modes?

TIA, Gary WA4YMZ Apex, NC FM05 (Gary_Rogers@DGC.ceo.dg.com)

Disclaimer: I don't speak for Data General and they don't speak for me! (Under most circumstances, including this one.)

1675. Re: What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 20:25:15 UTC
From: hrsblackwell@stars.gsfc.nasa.gov
Message-ID: <hrsblackwell-1110941625150001@macgwy-mac2.gsfc.nasa.gov>
Source record: 26629

In article <9410111859.AF00021@rtp41.rtp.dg.com>,
Gary_Rogers@DGC.ceo.dg.COM wrote:

> Message:
> Reading through the Kep lists, I keep seeing satellites that are
> unknown to me. In the list group "OSCAR", I see UO-11. In the list
> group "Micros", I see UO-14 and 22828. Under the list group "Misc.",
> I see POSAT and GRO. I know these last two aren't amateur
> satellites, but I curious anyway. Can anyone shed some light on
> these? If the first three are active, what are the up- and down-link
> frequencies and the operational modes?
>
> TIA, Gary WA4YMZ Apex, NC FM05 (Gary_Rogers@DGC.ceo.dg.com)
>
> Disclaimer: I don't speak for Data General and they don't speak for
> me! (Under most circumstances, including this one.)

Gary,
GRO is the Compton Gamma Ray Observatory. If I am not mistaken, UO is equivalent
to RS ? 22828 is just a NORAD object number for perhaps a new satellite but I do not know
what that one is.
--
Jim Blackwell
Goddard High Resolution Spectrograph Science Support
Computer Sciences Corporation
NASA/GSFC Code 681.0
Greenbelt, MD 20771

1676. Re: What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-11 23:56:27 UTC
From: rdcole@crl.com
Message-ID: <37f8nb$e32@crl5.crl.com>
Source record: 26635

Gary_Rogers@DGC.ceo.dg.COM wrote:
: Message:
: Reading through the Kep lists, I keep seeing satellites that are
: unknown to me. In the list group "OSCAR", I see UO-11. In the list
: group "Micros", I see UO-14 and 22828. Under the list group "Misc.",
: I see POSAT and GRO. I know these last two aren't amateur
: satellites, but I curious anyway. Can anyone shed some light on
: these? If the first three are active, what are the up- and down-link
: frequencies and the operational modes?

UO-11 UoSat is an Experimental satellite from England. There are no Uplink Frequencies listed for this satellite. I cant seem to locate the description of the purpose of the satellite right now. The Down link frequencies are. 145.826, 435.025, 2401.50. I think this is a telemetery bird with Pictures as a primary component of that data stream..

Micros are the"Microsats" these are store and forward packet satellites.

POSAT is a Comercial/Ham satellite. Most of the time it is operating in the Comercial mode. Check 435.250 & 435.280Dn, 145.925 & 145.975Up.

UO-14 ? I don't have a listing for that satellite. There is OSCAR 21 or RS-14 which is a regular u/V mode satellite (Mode B).

Ron

1677. Re: What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-12 11:33:08 UTC
From: thomsona@netcom.com
Message-ID: <thomsonaCxK5F9.CM1@netcom.com>
Source record: 26630

In article <9410111859.AF00021@rtp41.rtp.dg.com> Gary_Rogers@DGC.ceo.dg.COM writes:
>Message:
>Reading through the Kep lists, I keep seeing satellites that are
>unknown to me. In the list group "OSCAR", I see UO-11. In the list
>group "Micros", I see UO-14 and 22828. Under the list group "Misc.",
>I see POSAT and GRO. I know these last two aren't amateur
>satellites, but I curious anyway. Can anyone shed some light on
>these? If the first three are active, what are the up- and down-link
>frequencies and the operational modes?
>
>TIA, Gary WA4YMZ Apex, NC FM05 (Gary_Rogers@DGC.ceo.dg.com)
>
>Disclaimer: I don't speak for Data General and they don't speak for
>me! (Under most circumstances, including this one.)
>
>

22828 is the Norad number for ITAMSAT, Oscar 26.
POSAT is a Portuguese amateur satellite (with, interestingly, a
GPS receiver aboard).
GRO is the Compton Gamma Ray Observatory.

1678. EZSATS back on packet

Newsgroup: rec.radio.amateur.space
Date: 1994-10-12 13:34:40 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <37golg$6uo@usenet.INS.CWRU.Edu>
Source record: 26631

Good news!

Packet service has been partially restored to south central Wisconsin
and the EZSAT bulletins are back on packet. Does anybody want me to
continue to upload them here? And if so, is there any way to restrict
distribution to North America?

Dave, N9LTD

1679. Re: WINSAT AMSAT Software Question

Newsgroup: rec.radio.amateur.space
Date: 1994-10-12 13:49:02 UTC
From: mhogan@aol.com
Message-ID: <37gpge$g85@newsbf01.news.aol.com>
Source record: 26632

In article <CxIGno.GCp@murdoch.acc.Virginia.EDU>,
sem2r@galen.med.Virginia.EDU (Stacey E. Mills) writes:

It won't do it. You'll have to use logSat for windows if you want as much info as IT provides. To update, Add, sats just update file from an AMSAT FORMAT file. otherwise it will just dupe the current sats. It does not like any other format of keps. Logsat is available on C-serve hannet forum and AOL ham radio forum. Version 2.41 will be here soon. If registered it gives future scheduals etc. I have both programs and the LogSat is far superior to WinSat. That is a shame because winsat is pretty fast. I access from AOL so I dont know any othere way to get the program. Send me a disk and mailer and I'll make you a copy, less registration number.
The author has written me that I should have 2.41 real soon.
Mark Hogan, N5OBC
P.O. Box 2437
Broken Arrow, OK 74013

1680. Re: What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-12 14:53:35 UTC
From: neill.p.taylor@aea.ORGn.UK
Message-ID: <9410121452.AA14991@fusrs3b.culham.aea.orgn.uk>
Source record: 26633

Gary Rogers wrote:

>Reading through the Kep lists, I keep seeing satellites that are
>unknown to me. In the list group "OSCAR", I see UO-11. In the list
>group "Micros", I see UO-14 and ....

UO-11 is UoSAT-2/OSCAR-11 from the University of Surrey. Launched over 10
years ago but still going strong. No uplink for the "public" use,
although the Digital Communications Experiment (DCE) was the first
successful amateur satellite store-and-forward facility and linked packet
networks in many countries.
Still sends data on 145.826 MHz at 1200 baud including news bulletins,
and is very easy to decode. This satellite has been extremely popular
with school groups over the years because of the simplicity of the
ground station needed.

UO-14 is UoSAT-3/OSCAR-14, which was the first of the 9600 baud microsats.
However it also carried a non-amateur package (a VITA project, I think)
and eventually the bird was switched to 100% non-amateur use so that
UO-22 could become 100% amateur, where it gave better service.
There was also a UO-15, launched at the same time, but sadly it failed
shortly after launch.

Neill G4HLX

Dr. Neill P. Taylor UKAEA Government Division
Fusion
D3 Culham, Abingdon,
Oxfordshire OX14 3DB, UK.
Internet: neill.p.taylor@aea.orgn.uk
Tel: +44 1235 463348
Fax: +44 1235 463435

1681. What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-12 15:16:28 UTC
From: Ron.Parsons@f40.n382.z1.fidonet.org
Message-ID: <781972229.AA01318@afarm.uucp>
Source record: 26634

Object 22828 appears to be the "real" KO-25. It appears the KO-25 was originally pegged as 22830 but 22828 now tracks KO-25 much better.

Ron W5RKN

1682. NASCOM retransmit when?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 00:38:22 UTC
From: ai@iol.ie
Message-ID: <37hvhu$3hs@barnacle.iol.ie>
Source record: 26640

The Goddard Amateur radio club retransmit NASCOM on HF.
Are their transmissions only available while a Shuttle is up as I may
want to test a scanner in the very near future.
Thanks.

--
David Moore BSc FRAS, Editor of "Astronomy & Space" magazine.
(ai@iol.ie) Chairman, Astronomy Ireland, P.O.Box 2888, Dublin 1.
Tel: +353-1-459 8883. Fax: +353-1-459 9933.
_____Irish News: 1550-111-442 (calls cost upto 58p/minute)_____
_____U.K.: 0891-88-1950 (39p/min cheap, 49p/min all other times)_____

1683. Doppler problems in WinTrak 2.0

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 12:35:55 UTC
From: rparsons@tcet.unt.edu
Message-ID: <37j9jb$gl2@hermes.unt.edu>
Source record: 26639

I have been using WinTrak 2.0 but have problems with its Doppler calculations. The author says there are no problems with it, BUT the Doppler values calculated by InstantTrack, WiSP, OrbiTrack, SatTrak all agree with each other (within a few Hertz) but disagree with WinTrak.

WinTrak often gives Doppler values with the wrong sign.

Has anyone else using this puppy?

Ron W5RKN

1684. Re: Doppler problems in WinTrak 2.0

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 15:26:53 UTC
From: ggs@eule.lanl.gov
Message-ID: <37jk6e$he0@newshost.lanl.gov>
Source record: 26638

In article <37j9jb$gl2@hermes.unt.edu>, <rparsons@tcet.unt.edu> writes:
> I have been using WinTrak 2.0 but have problems with its Doppler
> calculations. The author says there are no problems with it, BUT the
> Doppler values calculated by InstantTrack, WiSP, OrbiTrack, SatTrak
all
> agree with each other (within a few Hertz) but disagree with WinTrak.
>
> WinTrak often gives Doppler values with the wrong sign.
>
> Has anyone else using this puppy?
>
> Ron W5RKN
>
I was interested in this program when it first came out so I called
the author to inquire about some details. I use a Kansas City Tracker
Tuner card to run things at the shack so I asked if he supported that
card. He said not only did he not support it but the KCT people were
out of business. This is news to L.L. Grace they think they are still
in business. Agreed there are some newer way to run your AZ/EL rotors
I think KCT must still be the most prolific system right now. He mostly
supports some parallel port box (can't remember which). Seems to me
this
guy is not a player in the satellite game, a view supported by your
experience.

Enough pontificating what are you to do?

Call AMSAT at 301-589-6062 they have a large selection of software all
of which WORKS get WISP if you want to use windows and forget WinTrak
as I have.

1685. TNC/Modem for PACSATS

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 15:53:02 UTC
From: ROBERTSM@JSC.MIL
Message-ID: <se9d1fcb.004@JSC.MIL>
Source record: 26642

Just getting into the digital satellite world.
Wonder what modem/TNC is being used by the community to receive
telemetry and operate through the PACSATS and other digital birds?
Are many of you using the AEA products (PK232, PK-96, PK900, or the
DSP series)? How easy is your terminal to use? What software is
usable?
Thanks, Mel W3MR robertsm@jsc.mil

1686. Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 17:12:12 UTC
From: caralt@gaig.upc.es
Message-ID: <37jppcINNco6@diable.upc.es>
Source record: 26636

I am gratefully surprised by all the interest showed through E-mail by this project. In response to all the people that required more information I would like to extend myself a bit further over the Static Satellite Tracking Device.
The system consists in a planar array of 19 elements. The disposition is crucial because of the frequency band I'm considering: UHF. By crucial I mean that a minute change in any of the describing factors of the array could ruin the beam shape and thus its directivity. This consideration is a hard limiter because it considerabily reduces the number of possible configurations
After a long period of tests and computer simulation I have decided that the best configuration is hexagonal, with all the elements spaced about half wavelength (this "about" is specially tricky) filling the hexagon in a triangular lattice. Many other configurations were considered (circular, square, linear, etc) but none proved to be so efficient in terms of directivity versus beam direction.
The next step is the control of the beam. We must take into account that most amateur satellites cross the sky in few minutes. Thus, an easy and fast control system must be used. Because I wanted the array to be totally static, the only way to move the beam is to gradually change the elements phase, as widely known. Using a small algorism I can find the adequate phase for each element and thus, direct the beam towards the place desired (that is, where the satellite is).
Another important decision to take is what radiating elements should be considered. As you
may well know, most satellites transmit with circular polarisation: that is because at this
frequencies is not possible to use linear polarisation because of Faraday's Rotation. So, we must find an element that, radiating together with the rest of the elements of the array, the transmitting-receiving electric field be circular polarised (the sense of rotation CW or CCW is also to be considered). I have carried out several computer simulations because I wanted to study the change in polarisation of the electro-magnetic field due too the changes of direction.
You all know about this: imagine a radiating loop placed in the XY plane. The polarisation in the z-axis (elevation=90 degrees) is circular (CW or CCW depending on the sense of the
feeding current). But as you decrease elevation, polarisation is no longer circular but elliptic. So, if the satellite is transmitting circular we get signal loss, depending on the excentricity of the ellipse. I've concluded that the best option is to use crossed half wave dipoles fed by equal current amplitude but a phase shift of 90 degrees to obtain circular polarisation.
Computer simulation showed that we can get almost 16 dB of directivity (gain) at elevation angles of 30 degrees. This means that the array can track satellites in a range of 120 degrees, which I thing is quite remarkable. If we can accept a loss of 3 dB the range increases to 140 degrees.
At present, I'm working on the design of the RF part. Things to solve are

(suggestions will be welcome):

1. Normally arrays have much noise problems than other devices. Fortunatelly I found an article containing some solutions, but eventhough we must use a pre-amp for each element. This amplifier has to have a good noise figure (and has to be cheap too!). I've been searching quite thoroughly but I can't find a suitable transistor (Phillips, Siemens, Advantek, etc).

2. The usage of a pre-amp implies a switching device that differenciates the tansmitting and the receiving. I would like to use an electronic device if possible, but a mechanic one should prove fine provided is easy to switch.

3. Phase shifters are made of lines of different lengths. The appropiate one is selected by diodes, depending of the phase the radiating element has to have. Because we are working with RF signals, the parasite condenser must be very low. PIN diodes have very low values, but are difficult to find.

I would also thank anyboody that could give information on:

4. Is there any phase shifter in chip?
5. Is there anybody who knows something about high directivity planar arrays? Am I the first to attempt doing such a device?
6. If you are an Amateur Satellite operator, I'll be delighted to know something about the most usual problems you have to cope with.

Yours faithfully

1687. Re: What are these??

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 20:32:00 UTC
From: rargyle@cc.weber.edu
Message-ID: <13OCT199413322834@cc.weber.edu>
Source record: 26637

In article <hrsblackwell-1110941625150001@macgwy-mac2.gsfc.nasa.gov>,
hrsblackwell@stars.gsfc.nasa.gov (Jim Blackwell) writes...
;>In article <9410111859.AF00021@rtp41.rtp.dg.com>,
;>Gary_Rogers@DGC.ceo.dg.COM wrote:
;>
;>> Message:
;>> Reading through the Kep lists, I keep seeing satellites that are
;>> unknown to me. In the list group "OSCAR", I see UO-11. In the list
;>> group "Micros", I see UO-14 and 22828. Under the list group "Misc.",
;>> I see POSAT and GRO. I know these last two aren't amateur
;>> satellites, but I curious anyway. Can anyone shed some light on
;>> these? If the first three are active, what are the up- and down-link
;>> frequencies and the operational modes?
;>>
;>> TIA, Gary WA4YMZ Apex, NC FM05 (Gary_Rogers@DGC.ceo.dg.com)
;>>
;>> Disclaimer: I don't speak for Data General and they don't speak for
;>> me! (Under most circumstances, including this one.)
;>Gary,
;> GRO is the Compton Gamma Ray Observatory. If I am not mistaken, UO is equivalent
;>to RS ? 22828 is just a NORAD object number for perhaps a new satellite but I do not know
what that one is.
;>--
;>Jim Blackwell
;>Goddard High Resolution Spectrograph Science Support
;>Computer Sciences Corporation
;>NASA/GSFC Code 681.0
;>Greenbelt, MD 20771

The RS (Radio Sputnik) are a Soviet series of amateur-radio-containing
satellites (that is, they are parts of a larger satellite; RS-14/15 are
two experiments on one spaceframe); their numbering is not part of the
OSCAR series. The UO-xx are University of Surrey (Guildford, Surrey,
UK) satellites, numbered in the OSCAR series. UO-14 is no longer
operational on amateur frequencies. Object 22828 _may_ be the actual
object number for KO-25; use KO-25 frequencies. UO-11 has beacons on
145.826, 435.025, and 2401.5 MHz; no open transponders.
Bob kb7kcl rargyle@cc.weber.edu home of Webersat/OSCAR-18

1688. Re: HELP!!! Any Way to Record Digital "Unattended"?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 21:15:15 UTC
From: anderson@kosepc01.delcoelect.com
Message-ID: <1994Oct13.211515.9788@kocrsv01.delcoelect.com>
Source record: 26646

In <37bagnINNdsd@gulfaero.com>,
Ken Terry <ken_terry@macmail.eng.gulfaero.com> writes:
>I am trying to record unattended data from my icom while I am at work,
>but regular audio tape does not give me the resolution I need. Either
>DAT or minidisk was recommended. However, I cannot keep my computer on
>all day to control the recorder due to afternoon lightening storms. If
>you have been able to record unattended signals on a digital format,
>please let me know the secret.

What "resolution" *do* you need? What do you mean by "resolution?"
What "data" are you trying to record? Is "digital" absolutely necessary?

If your signals are audio, you might try a hi-fi VCR; you'll get wonderful
fidelity on a two-hour tape, and it can turn *itself* on and off at
predetermined times.

==========
Alan Anderson || Ignorance can be fixed, but stupidity is permanent.
I speak AT, not FOR, Delco Electronics. || Ad Astra! (Ad LEO, anyway...)

1689. Re: AEA DSP-1232 problem

Newsgroup: rec.radio.amateur.space
Date: 1994-10-13 23:12:31 UTC
From: Dean Shutt <shuttd@arco.com>
Message-ID: <CxMwGw.Frp@news.arco.com>
Source record: 26644

My solution was to use a batch file that does not turn STEP to on until AOS. I am running a fully automatic station using Satsked.

shuttd@arco.com

1690. Question on AO13 schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 16:18:24 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <37mb0g$pda@newsstand.cit.cornell.edu>
Source record: 26650

Hi,

I'm getting active on AO13 again after about a year off, and I don't seem to be hearing it when I think I should be. Last night around 11 EDT I was listening to the beacon fine, but nobody was on the passband and I couldn't hear myself on it either. IT said that the phase was about 89 or so. Copying the data from the beacon said it should be in Mode B from 230 to 150, then pick up again at 190 (I take it it is off from 150 to 190?)

I know my station didn't suddenly go deaf, I can hear the beacon. I think it's on omnis for most of the lower half of the orbit because of bad pointing angles, but I worked it the other night well and heard a lot of folks on. Obviously I'm missing something, and when someone points it out I'll probably go "Duh!", but right now I'm confused.

I'm guess that the schedule is not as I think it is - so maybe someone can walk me through it.

Also, I've been listening for about a week or two, and haven't heard G4JUJ (Blimey!) on at his accustomed spot, nor the 890 gang. Where'd they all get to? They were my most reliable signal sources and fun to chat with.

73 de Kevin, WB2EMS (getting ready to hole up in the shack for the winter....)
"My cat thinks I'm her slow, stupid, servant."

1691. Re: NASCOM retransmit when?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 18:52:08 UTC
From: hrsblackwell@stars.gsfc.nasa.gov
Message-ID: <hrsblackwell-1410941452080001@macgwy-mac2.gsfc.nasa.gov>
Source record: 26648

In article <37hvhu$3hs@barnacle.iol.ie>, ai@iol.ie (Astronomy Ireland) wrote:

We only retransmit NASCOM audio during Shuttle Missions and then only when
1. The crew is awake
2. We can get volunteer operators for the station
3. Mechanical or environmental conditions let us.

Frequencies 3.860, 7.185 MHz LSB, 14.295, 21.395 MHz USB, 147.45 MHz FM Simplex

> The Goddard Amateur radio club retransmit NASCOM on HF.
> Are their transmissions only available while a Shuttle is up as I may
> want to test a scanner in the very near future.
> Thanks.
>
> --
> David Moore BSc FRAS, Editor of "Astronomy & Space" magazine.
> (ai@iol.ie) Chairman, Astronomy Ireland, P.O.Box 2888, Dublin 1.
> Tel: +353-1-459 8883. Fax: +353-1-459 9933.
> ________Irish News: 1550-111-442 (calls cost upto 58p/minute)________
> _____U.K.: 0891-88-1950 (39p/min cheap, 49p/min all other times)_____

--
Jim Blackwell
Goddard High Resolution Spectrograph Science Support
Computer Sciences Corporation
NASA/GSFC Code 681.0
Greenbelt, MD 20771

1692. More Static Tracking Device

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 18:57:55 UTC
From: caralt@gaig.upc.es
Message-ID: <37mkbjlNNo51@diable.upc.es>
Source record: 26649

[No readable article body recovered]

1693. More Static Satellite Tracking Device

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 19:30:32 UTC
From: caralt@gaig.upc.es
Message-ID: <37mm8oINNpi0@diable.upc.es>
Source record: 26641

I am gratefully surprised by all the interest showed through E-mail by this project. In response to all the people that required more information I would like to extend myself a bit further over the Static Satellite Tracking Device.
The system consists in a planar array of 19 elements. The disposition is crucial because of the frequency band I'm considering: UHF. By crucial I mean that a minute change in any of the describing factors of the array could ruin the beam shape and thus its directivity. This consideration is a hard limiter because it considerabily reduces the number of possible configurations
After a long period of tests and computer simulation I have decided that the best configuration is hexagonal, with all the elements spaced about half wavelength (this "about" is specially tricky) filling the hexagon in a triangular lattice. Many other configurations were considered (circular, square, linear, etc) but none proved to be so efficient in terms of directivity versus beam direction.
The next step is the control of the beam. We must take into account that most amateur satellites cross the sky in few minutes. Thus, an easy and fast control system must be used. Because I wanted the array to be totally static, the only way to move the beam is to gradually change the elements phase, as widely known. Using a small algorism I can find the adequate phase for each element and thus, direct the beam towards the place desired (that is, where the satellite is).
Another important decision to take is what radiating elements should be considered. As you may well know, most satellites transmit with circular polarisation: that is because at this frequencies is not possible to use linear polarisation because of Faraday's Rotation. So, we must find an element that, radiating together with the rest of the elements of the array, the transmitting-receiving electric field be circular polarised (the sense of rotation CW or CCW is also to be considered).I have carried out several computer simulations because I wanted to study the change in polarisation of the electro-magnetic field due too the changes of direction.
You all know about this: imagine a radiating loop placed in the XY plane. The polarisation in the z-axis (elevation=90 degrees) is circular (CW or CCW depending on the sense of the
feeding current). But as you decrease elevation, polarisation is no longer circular but elliptic. So, if the satellite is transmitting circular we get signal loss, depending on the excentricity of the ellipse.
I've concluded that the best option is to use crossed half wave dipoles fed by equal current amplitude but a phase shift of 90 degrees to obtain circular polarisation. Computer simulation showed that we can get almost 16 dB of directivity (gain) at elevation angles of 30 degrees. This means that the array can track satellites in a range of 120 degrees, which I thing is quite remarkable. If we can accept a loss of 3 dB the range increases to 140 degrees.

At present, I'm working on the design of the RF part. Things to solve are (suggestions will be welcome):

1. Normally arrays have much noise problems than other devices. Fortunatelly I found an article containing some solutions, but eventhough we must use a pre-amp for each element. This amplifier has to have a good noise figure (and has to be cheap too!). I've been searching quite thoroughly but I can't find a suitable transistor (Phillips, Siemens, Advantek, etc).

2. The usage of a pre-amp implies a switching device that differenciates the tansmitting and the receiving. I would like to use an electronic device if possible, but a mechanic one should prove fine provided is easy to switch.

3. Phase shifters are made of lines of different lengths. The appropiate one is selected by diodes, depending of the phase the radiating element has to have. Because we are working with RF signals, the parasite condenser must be very low. PIN diodes have very low values, but are difficult to find.

I would also thank anyboody that could give information on:

4. Is there any phase shifter in chip?
5. Is there anybody who knows something about high directivity planar arrays? Am I the first to attempt doing such a device?
6. If you are an Amateur Satellite operator, I'll be delighted to know something about the most usual problems you have to cope with.

Yours faithfully

1694. LL Grace??? (WAS: Re: Doppler problems in WinTrak 2.0

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 20:36:36 UTC
From: <>
Message-ID: <37mq4k$lbg@wizard.uark.edu>
Source record: 26651

ggs@eule.lanl.gov writes:

>I was interested in this program when it first came out so I called
>the author to inquire about some details. I use a Kansas City Tracker
>Tuner card to run things at the shack so I asked if he supported that
>card. He said not only did he not support it but the KCT people were
>out of business. This is news to L.L. Grace they think they are still
>in business. Agreed there are some newer way to run your AZ/EL rotors
>I think KCT must still be the most prolific system right now. He mostly
>supports some parallel port box (can't remember which). Seems to me
>this guy is not a player in the satellite game, a view supported by your
>experience.

>Enough pontificating what are you to do?
>
>Call AMSAT at 301-589-6062 they have a large selection of software all
>of which WORKS get WISP if you want to use windows and forget WinTrak
>as I have.

LL Grace is out of business according to the WinTrak guy? Wow. Then who
did we buy the KCT/T from last May?

Stick with Instant Track!! (how many v1.0's do *you* know that work so
well???)

Peter Laws<plaws@comp.uark.edu>|"Suppose you were a politician. Now suppose you
n5uwy@ka5bml.#nwar.ar.usa.noam |were an idiot. Ah, but I repeat myself."-Twain

1695. RE:CETI Transmission '76

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 22:14:28 UTC
From: MichaelMK@infoport.com
Message-ID: <15.47749752.InfoPort@infoport.com>
Source record: 26653

Shelley,

A while back, I posted a message in this forum regarding the availability, for downloading, of data from the SETI project. Unfortunately, I was never able to confirm whether there were any responses to the posting. Do you have any leads?

Thanks,
MichaelMK
Denver, CO **********

Message sent from InfoPort Online Service
Denver, Colorado USA (303) 429-0291 or telnet infoport.com
A full service bulletin board using NovaLink Professional Software
****

1696. Orbital Element Sets Wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 22:15:38 UTC
From: lynch@stars.gsfc.nasa.gov
Message-ID: <lynch.108.2E9F030A@stars.gsfc.nasa.gov>
Source record: 26643

Hello element heads,

I am looking for as much historical data regarding satellite orbits as I can find. I already got as much as I could from Dr. Kelso, and I am now hoping that someone on the net has an archive of these data.

I am currently researching atmospheric models and satellite drag, so historical info is more valuable than the current sets.

If anyone has any, or has an idea where to look, please let me know.

Thanks,
Dave Lynch

****
David Lynch e-mail:
Global Science and Technology lynch@gst.gsfc.nasa.gov
6411 Ivy Lane Suite 610 lynch@stars.gsfc.nasa.gov
Greenbelt MD. 20770
Phone STARS::LYNCH
(301) 474-9696
****

1697. Two-Line Orbital Element Sets (TLE486)

Newsgroup: rec.radio.amateur.space
Date: 1994-10-14 23:56:20 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.782178980@eel>
Source record: 26659

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #486 -
Alouette 1
1 00424U 62049 94284.21239887 .00000075 00000-0 77672-4 0 488
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2 04966 51.4417 217.2485 0917500 1.3007 359.0024 14.13929946789297
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Kvant-1
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RS-10/11
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2 18312 82.5532 119.1823 0012541 138.4642 221.7473 13.84039535361229
Meteor 2-17
1 18820U 88005A 94286.74101911 .00000067 00000-0 46197-4 0 4330
2 18820 82.5447 174.2882 0015492 204.7565 155.2847 13.84723577338769
DMSP B5D2-4
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2 18822 98.4300 136.0648 0006409 4.1239 355.9989 14.23122712347369
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METEOSAT 3
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2 19215 1.9882 71.6975 0000831 164.1098 106.1672 1.00266234 11104
AO-13
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2 19216 57.7136 226.3304 7236688 352.3018 0.7184 2.09719137 16952
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Meteor 3-2
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2 19336 82.5363 241.4341 0017398 337.5373 22.4984 13.16969310298556
Glonass 39
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2 19503 65.7338 345.6981 0008344 172.2595 187.8211 2.13101977 47075
NOAA 11
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TDRS 2
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2 19749 65.0028 106.3783 0006091 253.7051 106.3148 2.13101351 44581
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2 19802 55.1344 135.0758 0031039 175.7427 184.3581 2.00560447 41397
Akebono
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MOP-1
1 19876U 89020B 94278.88070192 -.00000077 00000-0 10000-3 0 793
2 19876 0.7566 67.2045 0000913 176.9649 79.3271 1.00275760 463
TDRS 3
1 19883U 89021B 94277.55050516 -.00000275 00000-0 00000+0 0 9988
2 19883 0.1048 36.9188 0006317 244.7826 248.5063 1.00270556192881
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2 20103 82.9617 200.2310 0037183 321.6789 38.1722 13.73843429264602
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1 20185U 89064A 94285.56950765 .00000025 00000-0 00000+0 0 9912
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GMS 4
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Meteor 3-3
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COBE
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Nadezhda 2
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Glonass 45
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Kristall
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AO-21
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OKEAN 3
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ERS-1
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2 21574 98.4923 352.8975 0001305 81.9786 278.1546 14.35945448168749
UO-22
1 21575U 91050B 94284.21428917 .00000047 00000-0 30357-4 0 5489
2 21575 98.4259 356.3104 0007324 310.2542 49.8001 14.36934979169748
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1 21576U 91050C 94284.19880086 .00000076 00000-0 40696-4 0 6431
2 21576 98.4230 355.0039 0003690 327.0928 33.0028 14.36336060169669
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1 21577U 91050D 94284.21368722 .00000028 00000-0 24389-4 0 5429
2 21577 98.4240 355.4915 0006132 315.1838 44.8854 14.36454451169695
SARA
1 21578U 91050E 94284.16986570 .00000353 00000-0 12880-3 0 7415
2 21578 98.4384 359.3765 0004660 316.9129 43.1696 14.38846906169886
TDRS 4
1 21639U 91054B 94286.43226714 .00000061 00000-0 10000-3 0 8167
2 21639 0.0706 29.4514 0001433 32.5865 301.1415 1.00276873105769
Meteor 3-5
1 21655U 91056A 94284.38229305 .00000051 00000-0 10000-3 0 7470
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2 21655 82.5551 34.6747 0011982 267.1362 92.8383 13.16833529151759
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1 21701U 91063B 94284.87998399 .00000405 00000-0 56362-4 0 6126
2 21701 56.9842 51.4324 0004613 101.9328 258.2219 14.96512306168409
DMSP B5D2-6
1 21798U 91082A 94286.91249902 .00000068 00000-0 59705-4 0 5790
2 21798 98.9642 293.0809 0012726 158.8329 201.3365 14.13837222148402
Glonass 53
1 21853U 92005A 94286.37935874 .00000076 00000-0 10000-3 0 9504
2 21853 64.9248 105.1072 0008620 196.1288 163.9052 2.13102245 21066
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1 21854U 92005B 94279.16276763 .00000068 00000-0 00000+0 0 359
2 21854 64.9278 105.3367 0016119 21.5798 338.5451 2.13103479 20891
Glonass 55
1 21855U 92005C 94285.79448487 .00000073 00000-0 00000+0 0 446
2 21855 64.9371 105.1163 0007348 191.6284 168.3974 2.13101542 21025
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1 21867U 92007A 94286.73343625 .00000785 00000-0 70366-4 0 4221
2 21867 97.7388 0.8319 0001545 150.8728 209.2961 14.98628202146131
GPS BIIA-12
1 21890U 92009A 94278.45245775 -.00000004 00000-0 00000+0 0 5719
2 21890 54.0664 252.2275 0056686 172.9865 187.0635 2.00562111 19199
GPS BIIA-13
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2 21930 55.6462 13.0723 0057266 150.6249 209.7357 2.00563059 18297
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1 21987U 92031A 94286.24114969 .00001653 00000-0 67831-4 0 3535
2 21987 28.4327 341.3988 0010195 184.0249 176.0272 15.18742024130367
SAMPEX
1 22012U 92038A 94284.38530333 .00001291 00000-0 11098-3 0 5726
2 22012 81.6692 48.2722 0120204 20.8375 339.7674 14.91162156123595
GPS BIIA-14
1 22014U 92039A 94285.67890111 -.00000045 00000-0 00000+0 0 4616
2 22014 54.8842 193.0502 0085895 305.8858 53.3619 2.00557391 10105
Glonass 56
1 22056U 92047A 94285.22548221 -.00000070 00000-0 00000+0 0 9459
2 22056 64.9166 344.8488 0006355 262.6836 97.3034 2.13102960 17109
Glonass 57
1 22057U 92047B 94285.52003720 -.00000071 00000-0 00000+0 0 9577
2 22057 64.9339 344.8651 0006971 304.4024 55.5964 2.13102609 17087
Glonass 58
1 22058U 92047C 94286.39909284 -.00000070 00000-0 00000+0 0 9630
2 22058 64.9260 344.8358 0010172 269.3177 90.6252 2.13102628 17150
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1 22076U 92052A 94284.37253274 -.00000038 00000-0 10000-3 0 8204
2 22076 66.0342 49.6700 0007306 265.6020 94.4150 12.80931064101372
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2 22077 66.0824 35.8455 0015344 259.3353 100.5937 12.86288007101787
S80/T
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1 22078U 92052C 94284.77080482 -.00000037 00000-0 10000-3 0 4383
2 22078 66.0820 35.0439 0016672 256.9165 102.9991 12.86570604101858
GPS BIIA-15
1 22108U 92058A 94275.17735580 .00000007 00000-0 10000-3 0 4716
2 22108 54.2942 253.0926 0107200 143.4808 217.2470 2.00559307 15073
FREJA
1 22161U 92064A 94272.70034322 -.00000107 00000-0 13299-6 0 4521
2 22161 63.0007 28.2348 0790393 324.2728 30.7753 13.21776468 95617
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1 22195U 92070B 94284.44425422 -.00000009 00000-0 10000-3 0 3472
2 22195 52.6830 20.2012 0137879 168.1790 192.2056 6.47293634 46479
GPS BIIA-16
1 22231U 92079A 94276.86303804 .00000003 00000-0 00000+0 0 4567
2 22231 54.7363 194.5900 0037457 290.7302 68.8703 2.00551269 13687
GPS BIIA-17
1 22275U 92089A 94278.99168184 .00000017 00000-0 00000+0 0 4860
2 22275 54.6446 192.0776 0042870 253.8656 105.7184 2.00569907 13139
TDRS 5
1 22314U 93003B 94278.18474537 -.00000288 00000-0 10000-3 0 4534
2 22314 1.3385 73.3606 0000993 123.2680 197.3592 1.00261755 6359
GPS BIIA-18
1 22446U 93007A 94284.04878298 -.00000050 00000-0 00000+0 0 4709
2 22446 54.6142 312.5716 0075356 345.6880 14.1027 2.00562788 12227
Glonass 59
1 22512U 93010A 94275.58756665 .00000096 00000-0 00000+0 0 6474
2 22512 64.9469 105.3161 0008909 190.4869 169.5699 2.13102245 12404
Glonass 60
1 22513U 93010B 94278.81228282 .00000072 00000-0 00000+0 0 6602
2 22513 64.9377 105.2195 0007166 181.6285 178.4280 2.13102481 12662
Glonass 61
1 22514U 93010C 94287.02638383 .00000079 00000-0 00000+0 0 6486
2 22514 64.9474 104.9370 0014316 185.4342 174.5954 2.13101295 12840
ASTRO-D
1 22521U 93011A 94279.85763025 .00000904 00000-0 72306-4 0 3431
2 22521 31.1018 94.4796 0075609 104.1797 256.7243 14.93342188 88809
UFO F1
1 22563U 93015A 94279.22970664 .00000042 00000-0 10000-3 0 3425
2 22563 26.4531 298.1561 0008103 261.0816 115.6717 0.99250192 9946
GPS BIIA-19
1 22581U 93017A 94284.19123289 -.00000088 00000-0 00000+0 0 3585
2 22581 55.1536 12.8865 0049043 35.3154 325.0345 2.00561074 11285
ARSENE
1 22654U 93031B 94262.03583661 -.00000123 00000-0 00000+0 0 2809
2 22654 2.0483 94.8577 2912797 191.9219 161.1305 1.42202795 2536
GPS BIIA-20
1 22657U 93032A 94284.33469814 -.00000089 00000-0 00000+0 0 3838
2 22657 55.1447 12.6692 0063182 195.2720 164.5707 2.00549746 6612
RADCAL
1 22698U 93041A 94287.10559045 .00000049 00000-0 15505-4 0 3473
2 22698 89.5421 303.2974 0091425 158.5362 201.9701 14.21321393 67481
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GPS BIIA-21
1 22700U 93042A 94286.28975842 -.00000027 00000-0 00000+0 0 3536
2 22700 54.4684 253.3901 0033217 325.9010 33.8502 2.00556909 9458
GPS BIIA-22
1 22779U 93054A 94275.40281569 -.00000019 00000-0 10000-3 0 3900
2 22779 54.7265 312.8549 0024774 236.8455 122.9801 2.00549219 7997
Meteor 2-21
1 22782U 93055A 94284.99032059 .00000012 00000-0 -26931-5 0 3508
2 22782 82.5468 113.8885 0021182 260.2664 99.6103 13.83015863 56232
UFO F2
1 22787U 93056A 94276.69327359 -.00000086 00000-0 00000+0 0 3269
2 22787 4.7312 323.8408 0004965 195.8001 174.4768 1.00278522 4188
SPOT 3
1 22823U 93061A 94284.27046653 .00000035 00000-0 37072-4 0 3621
2 22823 98.7066 356.9442 0000932 78.6641 281.4639 14.20037662 53961
STELLA
1 22824U 93061B 94275.18141034 -.00000044 00000-0 -43992-7 0 3376
2 22824 98.6449 349.7032 0005708 261.2396 98.8127 14.27098220 52936
AO-27
1 22825U 93061C 94284.64890901 .00000038 00000-0 33373-4 0 3406
2 22825 98.6448 359.2338 0007811 228.3764 131.6754 14.27636872 54307
IO-26
1 22826U 93061D 94285.18203164 .00000027 00000-0 28712-4 0 3382
2 22826 98.6432 359.8142 0008405 229.0416 131.0042 14.27741823 54387
HEATHSAT
1 22827U 93061E 94284.24249353 .00000065 00000-0 43849-4 0 4009
2 22827 98.6409 358.8438 0008505 217.7855 142.2727 14.27855872 54251
ITAMSAT
1 22828U 93061F 94284.74511794 .00000041 00000-0 34065-4 0 3177
2 22828 98.6404 359.4037 0009437 213.8387 146.2189 14.28069039 22413
PO-28
1 22829U 93061G 94284.75277065 .00000067 00000-0 44616-4 0 3327
2 22829 98.6417 359.4311 0009302 215.2615 144.7948 14.28043993 54337
KO-25
1 22830U 93061H 94284.74577107 .00000036 00000-0 32019-4 0 3452
2 22830 98.5454 355.3885 0010997 191.4058 168.6873 14.28066134 54332
GPS BIIA-23
1 22877U 93068A 94285.92473239 .00000010 00000-0 00000+0 0 1878
2 22877 55.2836 73.7196 0030960 290.7089 68.9583 2.00566938 7097
METEOSAT 6
1 22912U 93073B 94278.47808551 -.00000089 00000-0 00000+0 0 1535
2 22912 0.7127 266.3305 0002951 262.5604 7.8050 1.00271442 1633
HST Array
1 22920U 90037C 94280.04467971 .00005939 00000-0 48108-3 0 2224
2 22920 28.4689 220.5314 0003791 11.9227 348.1554 14.97747214 46278
Meteor 3-6
1 22969U 94003A 94284.57233250 .00000051 00000-0 10000-3 0 1147
2 22969 82.5601 334.1434 0015195 339.6133 20.4393 13.16724605 34163
TUBSAT-B
1 22970U 94003B 94284.17267251 .00000051 00000-0 10000-3 0 1053
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2 22970 82.5620 334.3948 0016080 339.1903 20.8567 13.16823071 34111
ODERACS A
1 22990U 94006B 94275.87334034 .01241558 11882-4 10000-4 0 2550
2 22990 56.9531 181.1715 0016571 4.8333 355.6801 16.51145506 37426
ODERACS B
1 22991U 94006C 94277.13419807 .08964689 11747-4 18828-3 0 2430
2 22991 56.9471 176.0597 0002015 78.0065 283.1536 16.46907725 37618
ODERACS E
1 22994U 94006F 94287.05457617 .00041841 10958-4 16099-3 0 1546
2 22994 56.9796 146.5080 0016011 64.5474 295.6859 15.88059296 38955
ODERACS F
1 22995U 94006G 94286.02935822 .00056936 11506-4 21160-3 0 1942
2 22995 56.9808 151.0340 0015904 64.1036 296.1683 15.88371032 38798
BREMSAT
1 22998U 94006H 94285.70901891 .00059175 11588-4 22281-3 0 1828
2 22998 56.9856 153.8861 0014194 76.8248 283.4399 15.88113954 22576
GPS BIIA-24
1 23027U 94016A 94286.00710385 -.00000098 00000-0 00000+0 0 1187
2 23027 55.0075 14.7145 0065375 193.4873 166.3637 2.00565774 4407
Glonass 62
1 23043U 94021A 94287.16126699 -.00000069 00000-0 00000+0 0 1164
2 23043 64.8005 345.2303 0007200 194.7927 165.2456 2.13102725 3965
Glonass 63
1 23044U 94021B 94287.04412016 -.00000069 00000-0 00000+0 0 1028
2 23044 64.7946 345.2362 0030615 204.6526 155.2648 2.13102792 3962
Glonass 64
1 23045U 94021C 94285.34270488 -.00000071 00000-0 00000+0 0 1152
2 23045 64.7852 345.3111 0009172 34.6539 325.4647 2.13102707 3923
GOES 8
1 23051U 94022A 94286.10212935 -.00000200 00000-0 00000+0 0 2007
2 23051 0.1957 265.1619 0004441 302.0680 120.0323 1.00261785 1470
MSTI 2
1 23101U 94028A 94287.06317428 .00006085 00000-0 12019-3 0 1000
2 23101 97.1117 119.1470 0014077 69.5068 290.7672 15.47403663 24425
STRV-1A
1 23125U 94034B 94278.73128768 .00003305 00000-0 74771-3 0 547
2 23125 6.9081 138.8286 7291752 268.9208 14.9580 2.27507601 2282
STRV-1B
1 23126U 94034C 94274.08658414 .00004235 00000-0 74904-3 0 505
2 23126 6.9328 141.0036 7298943 264.8391 16.5342 2.27064889 2070
Soyuz TM-19
1 23139U 94036A 94285.92523924 .00059369 00000-0 79500-3 0 1194
2 23139 51.6483 317.1889 0002444 108.6582 251.3591 15.57414712 16132
Nadezhda 4
1 23179U 94041A 94284.15719725 .00000040 00000-0 25336-4 0 442
2 23179 82.9492 332.4330 0037437 42.5774 317.8266 13.75658591 12230
Glonass 65
1 23203U 94050A 94286.88809730 -.00000037 00000-0 00000+0 0 621
2 23203 64.8243 224.7022 0006723 153.7746 206.2514 2.13101791 1353
Glonass 66
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1 23204U 94050B 94284.30689111 -.00000000 00000-0 00000+0 0 693
2 23204 64.8198 224.8277 0015324 342.2554 17.6901 2.13101852 1290
Glonass 67
1 23205U 94050C 94286.06674998 -.00000027 00000-0 10000-4 0 602
2 23205 64.8255 224.7491 0003044 297.6096 62.3543 2.13101937 1330
ProgressM24
1 23215U 94052A 94285.92523924 .00059369 00000-0 79500-3 0 860
2 23215 51.6483 317.1889 0002444 108.6582 251.3591 15.57414712 7531
DMSP B5D2-7
1 23233U 94057A 94286.83073391 .00000122 00000-0 90005-4 0 658
2 23233 98.9141 341.7204 0013388 113.1927 247.0656 14.12541689 6383
Cosmos 2291
1 23267U 94060A 94279.80864520 -.00000149 00000-0 00000+0 0 224
2 23267 1.4298 280.2204 0007159 73.3111 32.3871 1.00272124 151
1994060B
1 23268U 94060B 94268.09578600 .21691735 12784-4 16669-3 0 222
2 23268 51.6073 259.2490 0005202 298.6077 61.5231 16.52282919 557
1994060C
1 23269U 94060 C 94265.41103389 .13621660 00000-0 11070-2 0 61
2 23269 051.6074 274.3730 0002099 221.8841 138.2708 16.39060068000119
1994060D
1 23270U 94060D 94266.52259266 -.00000186 00000-0 10000-4 0 23
2 23270 1.4991 279.6655 0014064 359.0718 0.5948 1.00041851 15
1994060E
1 23271U 94060E 94286.88100852 .00000976 00000-0 67157-3 0 199
2 23271 47.4678 271.8121 7273756 5.6125 359.3712 2.26428712 544
1994060F
1 23272U 94060F 94286.86864837 .00002382 00000-0 15676+0 0 208
2 23272 104.9598 249.6044 0032721 153.4856 207.6122 15.70103060 34347
Cosmos 2292
1 23278U 94061A 94286.08823995 .00000547 00000-0 51328-4 0 254
2 23278 82.9917 233.7060 1028402 90.2232 281.6572 13.22012401 2050
1994061B
1 23279U 94061B 94286.82274688 .00000156 00000-0 10000-4 0 423
2 23279 82.9933 233.1789 1027949 87.5365 284.2851 13.23789809 2156
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1 23281U 94061C 94285.88294679 .00011909 00000-0 82268-3 0 199
2 23281 82.9946 233.7408 1052550 90.4879 281.6780 13.26958862 2035
1994061D
1 23286U 94061D 94286.87230866 .00003120 00000-0 65117-3 0 147
2 23286 83.0753 233.1537 0969871 89.2472 281.9540 13.13256319 2145
Soyuz TM-20
1 23288U 94063A 94278.86889464 .00180837 25460-4 24265-3 0 113
2 23288 51.6510 352.5617 0057352 128.0017 232.6197 16.02677397 315
1994063B
1 23289U 94063B 94279.63551980 .13661724 12607-4 28787-3 0 158
2 23289 51.6359 348.0107 0000966 29.8395 330.2636 16.46997558 446
Intelsat 703
1 23305U 94064A 94286.39071677 -.00000389 00000-0 00000+0 0 176
2 23305 0.2386 311.6418 0031678 165.3184 166.7700 1.00205819 71
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1994064B
1 23306U 94064B 94286.08313657 .00138073 76367-6 50221-3 0 79
2 23306 26.4555 294.2802 7441213 183.0300 167.2878 2.13860045 106
Solidaridad 2
1 23313U 94065A 94286.65358792 -.00000170 00000-0 00000+0 0 179
2 23313 0.0962 249.2958 0655450 138.4279 81.6011 1.08915653 71
Thaicom 2
1 23314U 94065B 94284.38474539 -.00000237 00000-0 00000+0 0 46
2 23314 0.0010 28.8840 0270581 359.8090 179.9990 1.02820590 60
1994065C
1 23315U 94065C 94286.72686979 .00142340 37809-6 59918-2 0 117
2 23315 4.0487 209.0260 7367619 181.4973 173.5513 2.20985189 87
1994065D
1 23316U 94065D 94286.15242672 .00070568 00000-0 88360-2 0 92
2 23316 3.9377 207.4936 7317382 182.7667 168.6281 2.25420436 72
Okean 1-7
1 23317U 94066A 94286.22300240 .00000589 00000-0 86267-4 0 102
2 23317 82.5446 262.8274 0024606 272.8529 86.9867 14.73845856 242
1994066B
1 23318U 94066B 94286.22269774 -.00000384 00000-0 -61346-4 0 93
2 23318 82.5439 262.8257 0024418 274.5892 85.2529 14.74127725 245
1994067A
1 23319U 94067A 94286.68587617 -.00000195 00000-0 10000-3 0 15
2 23319 0.2178 281.0033 0003692 201.0479 237.9993 0.99945753 01
1994067B
1 23320U 94067B 94287.28592593 .01847077 12164-4 35083-3 0 51
2 23320 51.6146 272.8464 0001038 339.2209 25.4272 16.31216008 985
1994067C
1 23321U 94067C 94287.28560185 .25814150 12480-4 13900-2 0 72
2 23321 51.6059 272.8388 0003739 73.0002 294.1486 16.42346011 980
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Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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1698. RS birds usual down link

Newsgroup: rec.radio.amateur.space
Date: 1994-10-15 14:33:14 UTC
From: brucerob@blues.epas.utoronto.ca
Message-ID: <37op7a$hod@alpha.epas.utoronto.ca>
Source record: 26645

I'm attracted to the RS series of birds as a first foray into satellite work. In particular, the 10m downlink seems very practical at this point in the sun spot cycle. I have, then, a few questions for the experienced:
1. I'm thinking of homebrewing my transmitter. Is the uplink usually 21 MHz, 144 MHz or evenly split between them?

2. What sort of power is practical for casual use of these birds? I have heard of qsos with 2w in a dipole; is that remarkable or par for the course?

3. Has anyone any experience using mobile whips (argh) as antennae for this application?

Thanks in advance, VE3UWL
Bruce G. Robertson
--
Bruce G. Robertson Dept. of Classics, U. of T.

1699. Any Amateur Satellite WWW Home Pages?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-16 04:03:24 UTC
From: jim@draco.bison.mb.ca
Message-ID: <37q8mc$jd6@draco.bison.mb.ca>
Source record: 26647

I am just getting into the Mosaic end of the Internet and am
wondering whether there are any HTML encoded WWW pages that showcase the
various AMSAT satellites. If there isn't something like this now it
would be a nice idea to have something like this.

--
Winnipeg MB Canada jim@draco.bison.mb.ca
TEAM OS/2 MIME OK
VE4JAF BlueSky Freenet coming soon!
Proud to be a non-hypenated Polish Canadian!

1700. Re: Any Amateur Satellite WWW Home Pages?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-16 17:08:17 UTC
From: dinga@lightside.com
Message-ID: <37rmm1$jlf@covina.lightside.com>
Source record: 26658

In article <37q8mc$jd6@draco.bison.mb.ca>, jim@draco.bison.mb.ca (Jim Jaworski) says:
>
> I am just getting into the Mosaic end of the Internet and am
>wondering whether there are any HTML encoded WWW pages that showcase the
>various AMSAT satellites. If there isn't something like this now it
>would be a nice idea to have something like this.
>
>
>
>--
>Winnipeg MB Canada jim@draco.bison.mb.ca
>TEAM OS/2 MIME OK
>VE4JAF BlueSky Freenet coming
soon!
>Proud to be a non-hypenated Polish Canadian!

Try the following, it's great!

http://hypatia.gsfc.nasa.gov/sarex_mainpage.html

1701. Next Sarex STS flight????66?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-16 18:57:01 UTC
From: wdunckel1@aol.com
Message-ID: <37rt1t$j7g@newsbf01.news.aol.com>
Source record: 26655

Could someone tell me what the next sarex mission number is? Ive had trouble trying to locate this!!

Thanks Walt

1702. MIR activity ?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-17 10:07:58 UTC
From: icesb@iroe.fi.cnr.it
Message-ID: <icesb.44.2EA24CFE@iroe.fi.cnr.it>
Source record: 26652

Some question on the MIR:
1) What about ham activity on MIR station ?
2) Is there a store and forward access,and when is active ?
3) Where is R2MIR-1 ?
4) I've heard that RV3DR is the QSL manager for MIR hamradio, is there an
internet address for RV3DR?
Thanks a lot in advance
Lapo Pieri IK5NAX

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del Consiglio nazionale delle Ricerche (IROE-CNR) |
| phone: +39 55 4235 276
[Istitute for the Research on Electromagnetic Waves | home: +39 55 410209
of the National Council of Research] |

1703. Upload and display problems with WISP

Newsgroup: rec.radio.amateur.space
Date: 1994-10-17 16:18:04 UTC
From: marcoh@world.std.com
Message-ID: <Cxtry5.B5A@world.std.com>
Source record: 26657

I am relatively new to digital satellites, but have successfully downloaded files from AO-16 and LO-19. I'm using the 2207 version WISP, and when I attempt to upload, after apparently transmitting the whole file (~800 bytes), WISP tells me "file not accepted by server".

Also, if you use WISP, do you find that the AOS/LOS display in the upper left corner of GSC overwrites part of the pass prediction and radio button displays?

If you know the cause or possible causes of these errors, would you please email me and I will summarize to the net.

Many thanks,

Marco

marcoh@world.std.com, n1mae@amsat.org

1704. Phase III, Modes B&J Equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-10-17 17:14:51 UTC
From: sem2r@galen.med.Virginia.EDU
Message-ID: <CxtuKr.6nt@murdoch.acc.Virginia.EDU>
Source record: 26660

I'm newly returned to hamming after 20 years off and want to
get onto the Phase III satellites, Modes B & J. I have a
Kenwood TS790, but I need recommendations regarding high-gain
circularly polarized antennas for 2 mtrs and 70 cm,
alt-azi rotators, preamplifers, and rotor tracking software and
hardware interfaces. Any and all advice would be welcomed!!!

Please respond directly to:

Stacey E. Mills / WB4QKT

E-Mail: SEM2R@galen.med.virginia.edu

Thanks for your help!! Stacey / WB4QKT

1705. Re: More Static Satellite Tracking Device

Newsgroup: rec.radio.amateur.space
Date: 1994-10-17 18:09:42 UTC
From: charlier@lsid.hp.com
Message-ID: <Cxtx47.Iuq@hpcvsnz.cv.hp.com>
Source record: 26654

Jordi Caralt Barba (caralt@gaig.upc.es) wrote:

(about planar phased electrically steerable antenna arrays)

: 5. Is there anybody who knows something about high directivity planar arrays?
: Am I the first to attempt doing such a device?

Back when I was fresh out of engineering school in 1978, I interviewed with Raytheon in Massachusetts. One of the things they showed me that they were working on was a UHF radar system for the military. I believe it was called PAVE-PAWS or something like that. It used large arrays of phased antennas (actually individual receiver/transmitters I think), and the beam was steered by controlling the phase at each antenna. I believe their system consisted of dozens or maybe even hundreds of antennas.

The one thing that really stuck out in my mind at the time was seeing the test equipment indicating frequencies right in the amateur 450 MHz band!

Perhaps there's someone around who worked on that thing that can supply more information.

The tricky thing, I would think, would be controlling the phase accurately enough; keeping it stable with temperature, and keeping the phase delays through any active elements consistent from antenna to antenna. I know from cutting 1/4 wave transmission lines on 450 MHz, that just a few millimeters of error can move you many MHz in frequency.

Lots of luck!

--
Charlie Panek KX7L Hewlett Packard Company
charlier@lsid.hp.com Lake Stevens Instrument Division
Everett, Washington

1706. Re: More Static Satellite Tracking Device

Newsgroup: rec.radio.amateur.space
Date: 1994-10-17 23:31:42 UTC
From: tls@gate.net
Message-ID: <37v1gu$1g5s@tequesta.gate.net>
Source record: 26656

Charlie Panek (charlier@lsid.hp.com) wrote:

: The one thing that really stuck out in my mind at the time was seeing
: the test equipment indicating frequencies right in the amateur 450 MHz band!

I believe that in most of the 450 MHz band government radiolocation is the
primary use, amateur is secondary.

1707. Re: More Static Satellite Tracking Device

Newsgroup: rec.radio.amateur.space
Date: 1994-10-18 16:31:47 UTC
From: coolidge@zk3.dec.com
Message-ID: <380t9j$4jb@jac.zko.dec.com>
Source record: 26564

--

Charlie Panek (charlier@lsid.hp.com) wrote:

: The one thing that really stuck out in my mind at the time was seeing
: the test equipment indicating frequencies right in the amateur 450 MHz
band!

tls@gate.net (Terry Steinford) replied:

I believe that in most of the 450 MHz band government radiolocation is the
primary use, amateur is secondary.

To which I add:

Check out the FCC Rules, in particular the ARRL printed version. You'll
see a couple of footnotes dealing with power limitations within 100-200
km of various USAF bases around the continental US, including Otis AFB
in Massachusetts, Eglin AFB in Florida, Offutt AFB in Nebraska (?), and
several others that I can't remember offhand. In fact, the rules were
tweaked a few years ago to permit 70cm amateur satellite uplink operation
in such a way so as NOT to cause interference with the PAVE/PAWS gear.

Also, don't forget that we're now explicitly sharing 449-450 with wind
shear warning equipment as well. Also, we cannot use 420-430 north of
Line A (to prevent QRM to Canadian land mobile users) nor within 50 miles
of certain major US cities along the Great Lakes (Buffalo, Cleveland,
Detroit, and some others). In all cases, we're definitely the
secondary allocation.

73,

Bayard, N1HO, in FN43ig (south of line A, way north of Otis AFB and
nowhere near the Great Lakes !)

Bayard R. Coolidge N1HO DISCLAIMER: The opinions expressed are
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Nashua, New Hampshire, USA those of Digital Equipment Corporation
coolidge@zk3.dec.com nor any other entity.
"Brake for Moose - It can save your life" - N.H. Fish & Game Dept.

1708. RE: Next Sarex STS flight is STS-67

Newsgroup: rec.radio.amateur.space
Date: 1994-10-19 20:49:35 UTC
From: pchien@ids.net
Message-ID: <3850k2$2r0@paperboy.ids.net>
Source record: 26577

The next shuttle flight with SAREX manifested is STS-67, the Astro-2 mission next February. The primary ham on the mission is Dr. Ron Parise WA4SIR, who you may remember from the STS-35 SAREX ASTRO-1 (notice how I place the more important payload first) mission of December 1990.

Several other crewmembers have expressed an interest in getting their licenses, the commander Steve Oswald already has his licence from a previous mission (and I can't remember his call sign!), Wendy Lawrence and Sam Durrance have taken their tests and are waiting for their call signs, etc.

Regretably SAREX is not flying on the STS-66 mission in November or the STS-63 mission in early February - even though both of those missions have astronauts assigned who have valid amateur radio licenses.

Philip Chien KC4YER
no sig yet

In Article <37rt1t$j7g@newsbf01.news.aol.com>
wdunckel1@aol.com (WDUNCKEL1) writes:
>Could someone tell me what the next sarex mission number is? Ive had
>trouble trying to locate this!!
>
>Thanks Walt

1709. WARNING: Potential Satellite Proton Event Warning

Newsgroup: rec.radio.amateur.space
Date: 1994-10-19 22:39:17 UTC
From: oler@ultrix.uleth.ca
Message-ID: <9410192239.AA14554@rho.uleth.ca>
Source record: 26570
Cross-posted to: rec.radio.amateur.space,rec.radio.info

From: oler@ultrix.uleth.ca (Cary Oler)
Message-Id: <9410192239.AA14554@rho.uleth.ca>
Subject: WARNING: Potential Satellite Proton Event Warning
Date: Wed, 19 Oct 94 16:39:17 MDT

/\

SATELLITE PROTON ENHANCEMENT ALERT

ISSUED: 03:30 UTC, 16 SEPTEMBER

/\

ATTENTION:

Protons at greater than 10 MeV became enhanced near 02:00 UTC on 16 September and are continuing to slowly rise. At the present time, protons at greater than 10 MeV are near 2 pfu. It is unlikely that the current enhancement will actually reach event levels of 10 pfu, although there is an remote chance this might happen.

The source of this activity is unknown, but most likely can be attributed to a solar region which departed the west limb several days ago. No x-ray enhancements of significance preceded this activity, supporting the notion that the source region might be some distance behind the west limb occulting the x-rays.

** End of Warning **

1710. (PKT): WARNING: Potential Satellite Proton Event Warning

Newsgroup: rec.radio.amateur.space
Date: 1994-10-19 22:52:44 UTC
From: oler@ultrix.uleth.ca
Message-ID: <9410192252.AA15580@rho.uleth.ca>
Source record: 26569
Cross-posted to: rec.radio.amateur.space,rec.radio.info

From: oler@ultrix.uleth.ca (Cary Oler)
Message-Id: <9410192252.AA15580@rho.uleth.ca>
Subject: (PKT): WARNING: Potential Satellite Proton Event Warning
Date: Wed, 19 Oct 94 16:52:44 MDT

$SPEA4259A
SOLAR PROTON ALERT - 16SEP94
PACKET RADIO REPORT
SOLAR TERRESTRIAL DISPATCH
(PACKET: VE6MGS@VE6MC.#EDM.AB.CAN.NOAM)
(INTERNET: COLER@SOLAR.STANFORD.EDU)

SOLAR PROTON ENHANCEMENT ALERT ISSUED AT 03:30 UTC ON 16 SEP:

Protons at greater than 10 MeV became enhanced near 02:00 UTC on 16
September and are continuing to slowly rise. At the present time, protons
at greater than 10 MeV are near 2 pfu. It is unlikely that the current
enhancement will actually reach event levels of 10 pfu, although there is
an remote chance this might happen.

The source of this activity is unknown, but most likely can be
attributed to a solar region which departed the west limb several days
ago. No x-ray enhancements of significance preceded this activity,
supporting the notion that the source region might be some distance
behind the west limb occulting the x-rays.

** END OF PACKET WARNING (1/1) **

1711. The HamSat Handbook- has the satellite Freqs ur l

Newsgroup: rec.radio.amateur.space
Date: 1994-10-20 11:07:00 UTC
From: jimmy.johnson@totrbbs.atl.ga.us
Message-ID: <83.13.uupcb@totrbbs.atl.ga.us>
Source record: 26574

Warren just read your mail on the Hamsat Handbook and it seem like that is the perfect thing I am looking for. However, did you give the correct date for the "up to date" information of Feb. 1993? If this is incorrect could you please give the correct up to date information. If this date was correct then I will just wait to purchase a copy at a later date.

Also I will ask you since you seem to be interested in satellites, what has happened to AO-21? I am just getting into satellite communications and don't have all the proper equipment as of yet but I use to enjoy listening to Oscar 21 but haven't heard a peep out of it in over a week. Can you help? Thanks for everything. 73 de Jimmy (KD4ISP)

Top Of The Rock BBS - Lilburn, GA SYSOP: Steve Diggs
UUCP: totrbbs.atl.ga.us Snailmail: 4181 Wash Lee Ct.
Phone: +1 404 921 8687 Lilburn, GA 30247-7407

1712. AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-10-20 11:12:00 UTC
From: jimmy.johnson@totrbbs.atl.ga.us
Message-ID: <84.13.uupcb@totrbbs.atl.ga.us>
Source record: 26575

Can anyone tell me what has happened to Oscar 21? I am just getting into satellite communications but do not have all the proper equipment as yet. However I did enjoy listening to AO-21 during its pass but haven't heard anything from it for over a week. Can anyone help?

I have just purchased a Yaesu FT-726R and need to either build or purchase my antenna's, but at least with the equipment I have now I could copy Oscar 21 quite well. Any help with this situation would be appreciated.

JIMMY
KD4ISP

Top Of The Rock BBS - Lilburn, GA SYSOP: Steve Diggs
UUCP: totrbbs.atl.ga.us Snailmail: 4181 Wash Lee Ct.
Phone: +1 404 921 8687 Lilburn, GA 30247-7407

1713. Re: RS birds usual down link

Newsgroup: rec.radio.amateur.space
Date: 1994-10-20 15:43:59 UTC
From: wwg@coutts.UUCP
Message-ID: <463@coutts.UUCP>
Source record: 26565

Bruce Robertson (brucerob@blues.epas.utoronto.ca) wrote:
: I'm attracted to the RS series of birds as a first foray into
: satellite work. In particular, the 10m downlink seems very practical
: at this point in the sun spot cycle. I have, then, a few questions for
: the experienced:
: 1. I'm thinking of homebrewing my transmitter. Is the uplink usually
: 21 MHz, 144 MHz or evenly split between them?

My limited experience with this bird is that RS-10 is the one that is
usually ON (RS-10 and RS-11 cannot operate at the same time).

I've never tried 15m up yet (antenna situation prevents this at the
moment), but when I was active, I was able to uplink on 2m often. You
can determine the mode by the CW telemetry, but with a 10-20 minute pass
max, you don't waste much time -- just try it. There is one mode that
accepts both 2m & 15m uplinks at the same time:

Mode KA: Uplink 21.160 - 21.200 21.210 - 21.250
Uplink 145.860 - 145.900 145.910 - 145.950
Downlink 29.360 - 29.400 29.410 - 29.450
BEACON 29.357 | 29.403 29.407 | 29.453
Robot: Uplink 21.120 21.130
Uplink 145.820 145.830
Downlink 29.403 | 29.357 29.453 | 29.407

Perhaps Mode KA is the "usual" mode?

: 2. What sort of power is practical for casual use of these birds?
: I have heard of qsos with 2w in a dipole; is that remarkable or par
: for the course?

I have heard my downlink with 3 watts on a good day. I'd suggest 5 - 10W
would be a good starting place for 2m uplinks. I have no 15m experience
on this bird.

: 3. Has anyone any experience using mobile whips (argh) as antennae for
: this application?

Adventurous aren't we?

: Thanks in advance, VE3UWL
: Bruce G. Robertson

Warren W. Gay VE3WWG John Coutts Library Services Limited
wwg@coutts.UUCP Niagara Falls, Ontario, Canada
(or wwg%coutts@uunet.ca, wwg%coutts@uunet.uu.net)

1714. Re: Question on AO13 schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-10-20 16:03:03 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.27.00100D85@teleport.com>
Source record: 26562

In article <37mb0g$pda@newsstand.cit.cornell.edu> F. Kevin Feeney <fkf1@cornell.edu>
writes:
>From: F. Kevin Feeney <fkf1@cornell.edu>
>Subject: Question on AO13 schedule
>Date: 14 Oct 1994 16:18:24 GMT

>Hi,

>I'm getting active on AO13 again after about a year off, and I don't seem
>to be hearing it when I think I should be. Last night around 11 EDT I was
>listening to the beacon fine, but nobody was on the passband and I
>couldn't hear myself on it either. IT said that the phase was about 89 or
>so. Copying the data from the beacon said it should be in Mode B from 230
>to 150, then pick up again at 190 (I take it it is off from 150 to 190?)

>I know my station didn't suddenly go deaf, I can hear the beacon. I think
>it's on omnis for most of the lower half of the orbit because of bad
>pointing angles, but I worked it the other night well and heard a lot of
>folks on. Obviously I'm missing something, and when someone points it out
>I'll probably go "Duh!", but right now I'm confused.

>I'm guess that the schedule is not as I think it is - so maybe someone
>can walk me through it.

>Also, I've been listening for about a week or two, and haven't heard
>G4JUJ (Blimey!) on at his accustomed spot, nor the 890 gang. Where'd
>they all get to? They were my most reliable signal sources and fun to
>chat with.

You may have experienced one of the times when the transponder is turned off.
I don't have the schedule in front of me, but there will be some times when it
is off due to the Earth eclipsing the satellite. I haven't been on mode B for
a while, so I can't tell you what happened to the "Blimey Limey".

Have Fun!

1715. Re: Upload and display problems with WISP

Newsgroup: rec.radio.amateur.space
Date: 1994-10-20 16:07:39 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.28.00102124@teleport.com>
Source record: 26563

In article <Cxtry5.B5A@world.std.com> marcoh@world.std.com (Mark A Heroux) writes:

>I am relatively new to digital satellites, but have successfully
>downloaded files from AO-16 and LO-19. I'm using the 2207 version
>WISP, and when I attempt to upload, after apparently transmitting
>the whole file (~800 bytes), WISP tells me "file not accepted by
>server".

This is a tough one. What TNC are you using?

>Also, if you use WISP, do you find that the AOS/LOS display in the
>upper left corner of GSC overwrites part of the pass prediction and
>radio button displays?

Try sizing the window larger. If this does not work, check your video driver
to see if there is one for "Small Fonts".

For the version of Wisp, use the numbers found in the Help-About box. I can't
tell from the numbers you gave above.

Bill

1716. Re: AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-10-20 18:45:16 UTC
From: 70353@gspc.lanl.gov, 403@compuserve.com
Message-ID: <386eeu$78a@newshost.lanl.gov>
Source record: 26561

Unfortunatly AO-21 has gone silent transponder. I have been in
contact with Peter Guelzow the control operator for the Amateur part
of AO-21 and he is at a loss as to what the trouble might be.
I understand that thermal and attitude control was abandoned
several weeks ago, after the last scheduled experiments were
completed. This is a tragic loss to the amateur satellite community,
as you noted it was a great place for the newcomer to get
started. It may be as simple as a pointing problem since the
attitude is no longer under control. If you want to ask for more
detail Peter can be e-mailed at db2os@amsat.org. I am particularly
sorry to see this bird go as we had a major expedition counting
on using it while in the arctic. Sorry to bring sad tidings
73 de Jerry KC5EGG

1717. More Satellite tracking for amateurs

Newsgroup: rec.radio.amateur.space
Date: 1994-10-21 18:26:13 UTC
From: caralt@gaig.upc.es
Message-ID: <389145INN5th@diable.upc.es>
Source record: 26566

I am gratefully surprised by all the interest showed through E-mail by this project. In response to all the people that required more information I would like to extend myself a bit further over the Static Satellite Tracking Device.
The system consists in a planar array of 19 elements. The disposition is crucial because of the frequency band I'm considering: UHF. By crucial I mean that a minute change in any of the describing factors of the array could ruin the beam shape and thus its directivity. This consideration is a hard limiter because it considerabily reduces the number of possible configurations. After a long period of tests and computer simulation I have decided that the best configuration is hexagonal, with all the elements spaced about half wavelength (this "about" is specially tricky) filling the hexagon in a triangular lattice. Many other configurations were considered (circular, square, linear, etc) but none proved to be so efficient in terms of directivity versus beam direction.
The next step is the control of the beam. We must take into account that most amateur satellites cross the sky in few minutes. Thus, an easy and fast control system must be used. Because I wanted the array to be totally static, the only way to move the beam is to gradually change the elements phase, as widely known. Using a small algorism I can find the adequate phase for each element and thus, direct the beam towards the place desired (that is, where the satellite is).
Another important decision to take is what radiating elements should be considered. As you
may well know, most satellites transmit with circular polarisation: that is because at this
frequencies is not possible to use linear polarisation because of Faraday's Rotation. So, we must find an element that, radiating together with the rest of the elements of the array, the transmitting-receiving electric field be circular polarised (the sense of rotation CW or CCW is also to be considered). I have carried out several computer simulations because I wanted to study the change in polarisation of the electro-magnetic field due too the changes of direction. You all know about this: imagine a radiating loop placed in the XY plane. The polarisation in the z-axis (elevation=90 degrees) is circular (CW or CCW depending on the sense of the feeding current). But as you decrease elevation, polarisation is no longer circular but elliptic. So, if the satellite is transmitting circular we get signal loss, depending on the excentricity of the ellipse. I've concluded that the best option is to use crossed half wave dipoles fed by equal current amplitude but a phase shift of 90 degrees to obtain circular polarisation.
Computer simulation showed that we can get almost 16 dB of directivity (gain) at elevation angles of 30 degrees. This means that the array can track satellites in a range of 120 degrees, which I thing is quite remarkable.
If we can accept a loss of 3 dB the range increases to 140 degrees.

At present, I'm working on the design of the RF part. Things to solve are (suggestions will be welcome):

1. Normally arrays have much noise problems than other devices. Fortunatelly I found an article containing some solutions, but eventhough we must use a pre-amp for each element. This amplifier has to have a good noise figure (and has to be cheap too!). I've been searching quite thoroughly but I can't find a suitable transistor (Phillips, Siemens, Advantek, etc).

2. The usage of a pre-amp implies a switching device that differenciates th transmitting and the receiving. I would like to use an electronic device if possible, but a mechanic one should prove fine provided is easy to switch.

3. Phase shifters are made of lines of different lengths. The appropiate one is selected by diodes, depending of the phase the radiating element has to have. Because we are working with RF signals, the parasite condenser must be very low. PIN diodes have very low values, but are difficult to find.

I would also thank anyboody that could give information on:

4. Is there any phase shifter in chip?
5. Is there anybody who knows something about high directivity planar arrays? Am I the first to attempt doing such a device?
6. If you are an Amateur Satellite operator, I'll be delighted to know something about the most usual problems you have to cope with.

Yours faithfully

1718. ARLK047 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-10-22 17:41:11 UTC
From: w1aw@arrl.org
Message-ID: <$arlk047.1994@ampr.org>
Source record: 26568
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK047
ARLK047 Keplerian data

ZCZC SK15
QST de W1AW
Keplerian Bulletin 47 ARLK047
From ARRL Headquarters
Newington, CT October 22, 1994
To all radio amateurs

SB KEP ARL ARLK047
ARLK047 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-66
1 99966U 94307.76579162 .00051270 00000-0 16849-3 0 26
2 99966 56.9997 196.6306 0011659 276.4103 83.5649 15.89544561 27
AO-10
1 14129U 83058B 94289.48195497 -.00000348 00000-0 10000-3 0 3242
2 14129 26.8030 302.7931 6025932 219.6206 75.3706 2.05881540 57313
RS-10/11
1 18129U 87054A 94292.38005554 .00000024 00000-0 10172-4 0 9745
2 18129 82.9252 237.0364 0012882 44.0813 316.1366 13.72342608366947
UO-11
1 14781U 84021B 94293.06337217 .00000174 00000-0 37372-4 0 7471
2 14781 97.7840 301.9351 0010762 228.9828 131.0446 14.69256351568645
RS-12/13
1 21089U 91007A 94292.90359627 .00000048 00000-0 34480-4 0 7469
2 21089 82.9197 278.9539 0030567 119.7822 240.6385 13.74048095185779
AO-13
1 19216U 88051B 94289.83915306 -.00000675 00000-0 10000-4 0 9846
2 19216 57.7079 225.4122 7238776 352.6062 0.6575 2.09727113 17067
UO-14
1 20437U 90005B 94293.20440151 .00000016 00000-0 23113-4 0 468
2 20437 98.5855 16.2512 0010711 180.6647 179.4521 14.29858832247458
AO-16
1 20439U 90005D 94293.18528199 .00000021 00000-0 25194-4 0 8449
2 20439 98.5946 17.6023 0011017 181.3296 178.7858 14.29912892247464
```

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DO-17
1 20440U 90005E 94293.26734657 .00000033 00000-0 29791-4 0 8459
2 20440 98.5958 18.0510 0011167 180.4971 179.6201 14.30052923247498
WO-18
1 20441U 90005F 94293.24494939 .00000021 00000-0 25148-4 0 8486
2 20441 98.5952 18.0195 0011596 180.8388 179.2773 14.30026432247490
LO-19
1 20442U 90005G 94292.65493458 .00000027 00000-0 27335-4 0 8437
2 20442 98.5961 17.7262 0011969 182.0129 178.1015 14.30124407247424
FO-20
1 20480U 90013C 94293.27365552 -.00000026 00000-0 91245-5 0 7419
2 20480 99.0572 61.5721 0541232 56.2117 308.9325 12.83227627220171
AO-21
1 21087U 91006A 94292.36296368 .00000094 00000-0 82657-4 0 5309
2 21087 82.9357 50.8005 0036410 96.9673 263.5626 13.74545926186647
UO-22
1 21575U 91050B 94293.19690594 .00000058 00000-0 34254-4 0 5503
2 21575 98.4248 5.0993 0006860 280.7084 79.3332 14.36936911171034
KO-23
1 22077U 92052B 94293.65204607 -.00000037 00000-0 10000-3 0 4432
2 22077 66.0819 17.2879 0015330 257.8052 102.1249 12.86288299102923
KO-25
1 22828U 93061F 94293.71337851 .00000011 00000-0 22181-4 0 3199
2 22828 98.6396 8.2730 0009739 185.3399 174.7670 14.28070072 23694
KO-25?
1 22830U 93061H 94294.20452313 -.00000024 00000-0 76247-5 0 3488
2 22830 98.5399 4.6367 0009470 167.1699 192.9728 14.28066081 55683
IO-26
1 22826U 93061D 94293.73185872 .00000036 00000-0 32438-4 0 3400
2 22826 98.6418 8.2675 0008766 199.8794 160.2047 14.27743111 55607
AO-27
1 22825U 93061C 94294.18056459 .00000019 00000-0 25710-4 0 3425
2 22825 98.6440 8.6587 0008196 196.5821 163.5104 14.27637890 55661
PO-28
1 22829U 93061G 94293.72118842 .00000027 00000-0 28398-4 0 3348
2 22829 98.6405 8.2998 0009854 185.5446 174.5618 14.28045159 55610
Mir
1 16609U 86017A 94293.24006359 .00000649 00000-0 15350-4 0 8187
2 16609 51.6470 280.5462 0002647 149.3494 210.7589 15.57467996495501

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
October 25, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1719. Yagi antennas

Newsgroup: rec.radio.amateur.space
Date: 1994-10-23 00:50:00 UTC
From: paul.britton@mhs.oz.au
Message-ID: <332.1.118@mhs.oz.au>
Source record: 26567

Does any one have any simple plans for antennas for receiving packet etc of
the vast array of amateur radio satellites as well as shuttle sarex missions.

Paul

Internet: paul.britton@mhs.oz.au (Paul Britton)
Fidonet : 3:714/905
Satcom Australia Space & Satellite BBS
Sydney Australia 612-9050849 28.8k

1720. Re: RS birds usual down link

Newsgroup: rec.radio.amateur.space
Date: 1994-10-23 03:09:19 UTC
From: trumpet-user@a.site.name
Message-ID: <trumpet-user.3.2EA9D3DE@a.site.name>
Source record: 26571

In article <37op7a$hod@alpha.epas.utoronto.ca> brucerob@blues.epas.utoronto.ca (Bruce Robertson) writes:
>From: brucerob@blues.epas.utoronto.ca (Bruce Robertson)
>Subject: RS birds usual down link
>Date: 15 Oct 1994 14:33:14 GMT

>I'm attracted to the RS series of birds as a first foray into
>satellite work. In particular, the 10m downlink seems very practical
>at this point in the sun spot cycle. I have, then, a few questions for
>the experienced:
>1. I'm thinking of homebrewing my transmitter. Is the uplink usually
>21 MHz, 144 MHz or evenly split between them?

>2. What sort of power is practical for casual use of these birds?
>I have heard of qsos with 2w in a dipole; is that remarkable or par
>for the course?

>3. Has anyone any experience using mobile whips (argh) as antennae for
>this application?

>Thanks in advance, VE3UWL
>Bruce G. Robertson

RS-10 and RS-11 are on the same satellite. RS-11 is in standby until RS-10 fails.

Ditto for RS-12 and RS-13. RS-13 is in standby until RS-12 fails.

RS-10 has operated mode A (2 meters up and 10 m down) for years.
RS-12 has operated mode K (15 meters up and 10 m down) for years.

If you key up your HT/rubber duck on a quiet RS-10 pass, you can often hear it on the downlink. Morse QSOs have been accomplished by keying HT PTT switches.

Dave, N9LTD

1721. Re: AO-21

Newsgroup: rec.radio.amateur.space
Date: 1994-10-23 05:33:03 UTC
From: mhogan@aol.com
Message-ID: <38csif$o8s@newsbf01.news.aol.com>
Source record: 26572

In article <84.13.uupcb@totrbbs.atl.ga.us>,
jimmy.johnson@totrbbs.atl.ga.us (Jimmy Johnson) writes:

Been on vacation in Minden Nev, and AOL is out of touch there. There was
a message on packet up there that AO-21 died and they were trying to find
out if there was a way to get it back on line. WA6EWV-1 out of Tahoe was
the bbs I read the post on.

I hope they get it back. I think the post went something like the main
user was done with the sat and they didnt know if they were gonna control
it any more...
Hogan / N5OBC

1722. APT-Satellites: Report OCT 23, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-10-24 08:41:39 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-241094084446@oskar.gmd.de>
Source record: 26573

```
Observed at station 50.7 NLat, 7.1 ELon, OCT 23, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 On
NOAA-11: APT 137.62 Burst On, no AVHRR
NOAA-12: APT 137.50 On
Meteor 3-5: APT 137.85 On
Okean 7-1 APT 137.40 Sometimes On

NOAA-11 imaging is dead. Okean 1-7 started APT during
rev. #176 over the Black See at 13h 11min 10sec UT ascending.
I copied a very dark vis-image 240 lpm from a max elevation
of 12 deg, this showed the spacecraft clock was working at
973 mins after midnight moscow-time = 16h13mins Moscow-time
= 13.13 UT. During next rev #177 APT was OFF.
I wonder if the satellite is ever active over the US,
please mail your observations.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

1723. ARLS033 STS66 prelaunch Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-10-24 17:33:56 UTC
From: w1aw@arrl.org
Message-ID: <$arls033.1994@ampr.org>
Source record: 26576
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB SPACE @ ARL $ARLS033
ARLS033 STS66 prelaunch Keps

ZCZC AS77
QST de W1AW
Space Bulletin 033 ARLS033
From ARRL Headquarters
Newington, CT October 24, 1994
To all radio amateurs

SB SPACE ARL ARLS033
ARLS033 STS66 prelaunch Keps

STS-66
1 00066U 94307.76579162 .00051270 00000-0 16849-3 0 29
2 00066 56.9997 196.6306 0011659 276.4103 83.5649 15.89544561 20

Satellite: STS-66
Catalog number: 00066
Epoch time: 94307.76579162 = (03 NOV 94 18:22:44.40 UTC)
Element set: 002
Inclination: 56.9997 deg
RA of node: 196.6306 deg Space Shuttle Flight STS-66
Eccentricity: .0011659 Prelaunch element set JSC-002
Arg of perigee: 276.4103 deg Launch: 03 NOV 94 16:56 UTC
Mean anomaly: 83.5649 deg
Mean motion: 15.89544561 rev/day Gil Carman
Decay rate: 5.1270e-04 rev/day sq NASA Johnson Space Center
Epoch rev: 2
Checksum: 321

The deorbit burn will be on orbit 172 at MET 10/18:47 (Nov 14 at 11:43 UTC).

Gil Carman, WA5NOM
NASA Johnson Space Center
NNNN
/EX
```

1724. Am I the only one having trouble to pick up MIR?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-24 23:32:28 UTC
From: reykowsk@eemips.tamu.edu
Message-ID: <38hg6c$kev@news.tamu.edu>
Source record: 26578

Hi,
Over the last two weeks, I tried to pick up the MIR beacon at 145.55MHz,
so far to no avail. At two times, I tried to actually see MIR during
visible passes but: nada!
I use the orbital elements from ARCHIVE.AFIT.AF.MIL which should be accurate.
So my question:
Anybody else having problems to pick up MIR?

Arne

1725. Re: Am I the only one having trouble to pick up MIR?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-25 08:17:57 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.28.00084CDF@teleport.com>
Source record: 26580

In article <38hg6c$kev@news.tamu.edu> reykowsk@eemips.tamu.edu (Arne Reykowski) writes:
>From: reykowsk@eemips.tamu.edu (Arne Reykowski)
>Subject: Am I the only one having trouble to pick up MIR?
>Date: 24 Oct 1994 23:32:28 GMT

>Hi,
>Over the last two weeks, I tried to pick up the MIR beacon at 145.55MHz,
>so far to no avail. At two times, I tried to actually see MIR during
>visible passes but: nada!
>I use the orbital elements from ARCHIVE.AFIT.AF.MIL which should be accurate.
>So my question:
>Anybody else

Everybody else. Mir has had a power generation problem, so the Amateur
equipment was turned off. I have heard that there were rare exceptions during
Europe passes. I have also heard that by the time you read this, the problems
should be fixed and you should be able to get them.

I guess it's about time I tuned them in. U3MIR was my first contact as an
Amateur.

Have fun!!!
Bill, N7RYW, Portland, OR

1726. Re: Am I the only one having trouble to pick up MIR?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-25 12:59:00 UTC
From: achall@lmsmgr.lerc.nasa.gov
Message-ID: <25OCT199408590917@lmsmgr.lerc.nasa.gov>
Source record: 26579

In article <38hg6c$kev@news.tamu.edu>, reykowsk@eemips.tamu.edu (Arne Reykowski) writes...
>
>Hi,
>Over the last two weeks, I tried to pick up the MIR beacon at 145.55MHz,
>so far to no avail. At two times, I tried to actually see MIR during
>visible passes but: nada!
>I use the orbital elements from ARCHIVE.AFIT.AF.MIL which should be accurate.
>So my question:
>Anybody else having problems to pick up MIR?
>
>Arne
>

I had been listening to static as well until 7:16 UTC 10/24.. I
heard DP3MIR calling CQ! I even managed to work him :) :)

73

Steve - KK4PM

1727. Re: Upload and display problems with WISP

Newsgroup: rec.radio.amateur.space
Date: 1994-10-25 13:08:21 UTC
From: n4hy@growler.ccr-p.ida.org
Message-ID: <N4HY.94Oct25130821@growler.ccr-p.ida.org>
Source record: 26581

There is a control packet sent back from the spacecraft to the ground saying
that the file's checksums did NOT check. This could easily happen if
the data between your computer and your TNC gets corrupted. This happened
to me regularly until I replace the piece of crap cable talking 38400 bps
to my DSP2232 with a `real' RS-232 shielded ($35) cable.

Bob

Robert W. McGwier | n4hy@ccr-p.ida.org: ham radio, scouts,
Center for Communications Research | astronomy, golf (o yea, & math!) ASM
Princeton, N.J. 08520 | Troop 5700, ACM Pack 53, Sanhican #2 WWW,
(609)-279-6240(v) (609)-924-3061(f)| District and Council Activities Chair.
(609-443-8963 (h) | I used to be a Buffalo . . . NE III-120
| proud parent in Brownie Troop 196
--
Robert W. McGwier | n4hy@ccr-p.ida.org: ham radio, scouts,
Center for Communications Research | astronomy, golf (o yea, & math!) ASM
Princeton, N.J. 08520 | Troop 5700, ACM Pack 53, Sanhican #2 WWW,
(609)-279-6240(v) (609)-924-3061(f)| District and Council Activities Chair.
(609-443-8963 (h) | I used to be a Buffalo . . . NE III-120
| proud parent in Brownie Troop 196

1728. APT-Satellites: Report OCT 23, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-10-25 18:40:00 UTC
From: leo.wikholm@compart.fi
Message-ID: <1f.2105.1818.0NC9F075@compart.fi>
Source record: 26582

```
-> NOAA-11 imaging is dead. Okean 1-7 started APT during
-> rev. #176 over the Black See at 13h 11min 10sec UT ascending.
-> I copied a very dark vis-image 240 lpm from a max elevation
-> of 12 deg, this showed the spacecraft clock was working at
-> 973 mins after midnight moscow-time = 16h13mins Moscow-time
-> = 13.13 UT. During next rev #177 APT was OFF.
-> I wonder if the satellite is ever active over the US,

We have also received a picture from Okean 1-7 satellite
on Oct 23 here in Finland. The picture was very dark.
The station was Vehkalahti +60.34 N +27.04 E.

Leo Wikholm
e-mail: leo.wikholm@compart.fi
```

1729. HAM*INFO*LINK*SOURCE BBS

Newsgroup: rec.radio.amateur.space
Date: 1994-10-25 19:22:17 UTC
From: kb6axk@netcom.com
Message-ID: <kb6axkCy8tt5.Kqu@netcom.com>
Source record: 26583

new amateur radio "ham" bbs at 818-584-1952
73 & 88 de kb6axk,joe

--
US AMATEUR RADIO |sysop of the HAM*INFO*LINK*SOURCE BBS|
KB6AXK | at 1-818-584-1952,joe cira |
PASADENA,CAL,91107| kb6axk@netcom.com |

1730. Re: Question on AO13 schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-10-25 20:41:43 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <38jqi7$618@newsstand.cit.cornell.edu>
Source record: 26584

In article <n7ryw.27.00100D85@teleport.com> William Roth,
n7ryw@teleport.com writes:
>
>You may have experienced one of the times when the transponder is turned
off.
>I don't have the schedule in front of me, but there will be some times
when it
>is off due to the Earth eclipsing the satellite. I haven't been on mode
B for
>a while, so I can't tell you what happened to the "Blimey Limey".
>
>Have Fun!

that is what I was wondering, but according to the lastest stuff on the satellite's beacon, it should have been on. Now it has off times, since OCT 22, but this was 2 weeks ago. I think we have about 2 months of off for eclipse times coming up, then the pointing will be better again and the schedule more normal.

I used to do mode JL, but now that that's gone, I'm B only. Don't have a converter for S, though maybe next year....

Thanks

Kevin

1731. FM reception on HT - any advice?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-26 14:55:54 UTC
From: donovan@lpopsb.mayo.edu
Message-ID: <1994Oct26.095554.1@lpopsb>
Source record: 26588

Hello,

I was wondering what the odds of picking up
a FM 2meter downlink on a HT. I thought
Oscar-21 would be possible but it appears
there is conversation that it is sick now...
are there any others...transmitting a strong
enough signal (FM 2meters) to receive on an
HT....lets assume a good pass also....

any replies would be greatly welcomed..I
am new to amateur radio and have a growing
interest in the satellites...I only have
a 2meter HT now so I think my options are
limited to listening to downlinks.

Thanks,

Dave Donovan
ddonovan@mayo.edu

1732. Re: Kenwood TR9000 Info

Newsgroup: rec.radio.amateur.space
Date: 1994-10-26 15:59:07 UTC
From: bcieslak@mkelan5.remnet.ab.com
Message-ID: <bcieslak.12.000FFC58@mkelan5.remnet.ab.com>
Source record: 26585

I just gotta ask, bein halloween and all....Are you the Stephen King Author of some of my favorite nightmares.

Brian AE9K

In article <38lqvn$15pc@usenetw1.news.prodigy.com> XXBF87A@prodigy.com (STEPHEN KING) writes:>From: XXBF87A@prodigy.com (STEPHEN KING)>Subject: Re: Kenwood TR9000 Info
>Date: 26 Oct 1994 15:01:11 GMT

>Hi!
>Yes I have a TR9000 - a fine old rig. And yes you need to hold down the
>PTT to get it to transmit -- that is just the way that it works in CW
>mode -- never understood it myself! Have not used mine for a long time,
>but it isn't bad for phase II type work. Good luck! 73 ---- Steve KD3OG

1733. Uzbekistan licensing requirements?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-26 18:17:08 UTC
From: bc21470@bingsuns.cc.binghamton.edu
Message-ID: <38m6f4$5iv@bingnet1.cc.binghamton.edu>
Source record: 26586

[No readable article body recovered]

1734. Re: WINSAT AMSAT Software Question

Newsgroup: rec.radio.amateur.space
Date: 1994-10-26 22:36:10 UTC
From: pp000814@interramp.com
Message-ID: <38mufb$dfa@www.interramp.com>
Source record: 26587

Is the software on the internet for FTP?

In article <38cstn$obr@newsbf01.news.aol.com>, <mhogan@aol.com> writes:
> Path:
interramp.com!psinntp!rutgers!cis.ohio-state.edu!math.ohio-state.edu!howland.re
ston.ans.net!pipex!uunet!newstf01.cr1.aol.com!newsbf01.news.aol.com!not-for-mai
l
> From: mhogan@aol.com (MHOGAN)
> Newsgroups: rec.radio.amateur.space
> Subject: Re: WINSAT AMSAT Software Question
> Date: 23 Oct 1994 01:39:03 -0400
> Organization: America Online, Inc. (1-800-827-6364)
> Lines: 13
> Sender: news@newsbf01.news.aol.com
> Message-ID: <38cstn$obr@newsbf01.news.aol.com>
> References: <37gpge$g85@newsbf01.news.aol.com>
> NNTP-Posting-Host: newsbf01.news.aol.com
>
> In article <37gpge$g85@newsbf01.news.aol.com>, mhogan@aol.com (MHOGAN)
> writes:
>
> To the WINSAT guy... Been on vacation New software came while I was gone
> and I made you a copy tonight. To all others I will upload 2.41 to AOL
> tonight and check to see if Roberto got it on C-Serve. As far as Me
> making copies, send a mailer, blank disk and put your address and stamps
> on the mailer. I will send your copy ASAP. 2.41 looks real good, but
> please reware Roberto for his work. He has done alot for us all. My rig
> died two weeks ago so I need to get another one while I have taht fixed,
> and I never have been a power on the birds, Kinda brand new really
> See yaall
> Hogan / N5OBC

1735. ### How do I find a satellite?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-27 12:24:28 UTC
From: s2202629@np.ac.sg
Message-ID: <38o65s$buk@nova.np.ac.sg>
Source record: 26602

How do I find if there are any amateur satallites passing over me
and what freqs/bands do they use, and when will they be above me, and how
long will they be there?

You get the general idea... 8)

Rgds!

1736. Re: ### How do I find a satellite?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-27 12:25:48 UTC
From: s2202629@np.ac.sg
Message-ID: <38o68c$bup@nova.np.ac.sg>
Source record: 26603

Sorry, I meant when I said satellites, I meant things in space with amateur equiptment, as well as astronauts if any.

And my post got clipped. Last line was supposed to read "I'm geograpically located in Singapore".

.
.
.

1737. Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-27 21:15:48 UTC
From: ag845@FreeNet.Carleton.CA
Message-ID: <CyCoEC.3A3@freenet.carleton.ca>
Source record: 26589

Hello, I'm a 'year-old ham' and am interested in receiving satellite images (eg. weather) and contacts. Could someone give me some information on what type of antenna's to make(or buy) and what i need in terms of radio equipment and software to run on my 486? At present I have a 2m handheld and a bunch of dusty radio-shack scanners! I realize that there is a lot of info I need to catch up on, but any help you can offer will point me in the proper direction. Thank you for your help everyone! 73's

Darryl Millson (VE3 EKV)
Ottawa, Ontario, Canada
ag845freenet.carleton.ca

1738. Re: FM reception on HT - any advice?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-27 21:53:47 UTC
From: tboza@sedona.intel.com
Message-ID: <38p7hb$6nn@chnews.intel.com>
Source record: 26591

In article <1994Oct26.095554.1@lpopsb>, donovan@lpopsb.mayo.edu writes:
> Hello,
>
> I was wondering what the odds of picking up
> a FM 2meter downlink on a HT. I thought
> Oscar-21 would be possible but it appears
> there is conversation that it is sick now...
> are there any others...transmitting a strong
> enough signal (FM 2meters) to receive on an
> HT....lets assume a good pass also....
>
> any replies would be greatly welcomed..I
> am new to amateur radio and have a growing
> interest in the satellites...I only have
> a 2meter HT now so I think my options are
> limited to listening to downlinks.
>
> Thanks,
>
> Dave Donovan
> ddonovan@mayo.edu

I have worked several stations on AO-27 using only
a HT and a 1/4 wave wip antenna. "It can be done!"

AO-27, 145.850 MHz FM up
436.800 MHz FM dn

AO-27 is only a part time amateur satellite FM repeater, weekends
ONLY! During amateur usage, its on solar panel engery only. This
means the satellite needs to be on the sunny side of its orbit
(daytime at your QTH).

Be sure to adjust for doppler shift. At the beginning of the pass,
start listening around 436.805 to 436.810 MHz and tune downward
as the pass proceedes. At the end of the pass, you will be tuning
around 436.760 MHz

Tom WB7ASR...

1739. Re: Balloon Launch materials needed

Newsgroup: rec.radio.amateur.space
Date: 1994-10-27 22:46:01 UTC
From: wai@aol.com
Message-ID: <38paj9$9m9@newsbf01.news.aol.com>
Source record: 26590

Check the "Nuts and Volts" magazine. I think I saw a surplus place
selling
1 GHZ radiosondes.

Also check with WB8ELK, he sends up ballons with ATV equipment.

Wai - WB3BHT

1740. Re: WINSAT AMSAT Software Question

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 02:30:12 UTC
From: mhogan@aol.com
Message-ID: <38pnnk$dq3@newsbf01.news.aol.com>
Source record: 26592

In article <38mufb$dfa@www.interramp.com>, pp000814@interramp.com writes:

I have no Idea, or the way to put it on FTP. I have a bud that might,
I'll try. I sent a copy to the guy on the east coast, maby he can put it
on ftp.
I use AOL for access here if you know how I can do it let me know
Mark Hogan / N5OBC

1741. Re: Balloon Launch materials needed

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 04:43:06 UTC
From: wdunckel1@aol.com
Message-ID: <38pvgq$gbd@newsbf01.news.aol.com>
Source record: 26593

Electronic Goldmine sells them for 8.95.No data though!!!!!!Transmits at 1.677 ghz. I bought two, but was disapointed that there was not more data. Also disapointed that I could not find info on the pressure sensor on the radiosonde.
Electronic Goldmines phone number is 602-451-7454 fax 602-451-9495
Good luck!!

Walt KD6VYV

1742. Re: FM reception on HT - any advice?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 05:05:04 UTC
From: wdunckel1@aol.com
Message-ID: <38q0q0$gmh@newsbf01.news.aol.com>
Source record: 26594

In article <1994Oct26.095554.1@lpopsb>, donovan@lpopsb.mayo.edu writes:

>I was wondering what the odds of picking up
>a FM 2meter downlink on a HT.
>are there any others..strong
>enough signals (FM 2meters) to receive on an
>HT....lets assume a good pass also....

>any replies would be greatly welcomed..I
>am new to amateur radio and have a growing
>interest in the satellites...I only have
>a 2meter HT now so I think my options are
>limited to listening to downlinks.

Actually modern HT's can pick up fairly weak signals. I know the Dove satelite was operating ok and you can pick up its signal, but I cant remember its freq. It would be a little more exciting if you had a TNC packet controler, then you could see its signal. Make sure that it is in fact still operating.
I have heard the Mir Satellite (The Mirs has battery probs at the moment and can be heard only sporaticaly). I have also been able to transmit and be heard and retransmited by Mir using packet. My longest connect has been in Canada and I live near San Francisco!!! This was all done by my HT at less than 5 watts!!
I have also heard some of the crew on STS-64 space shuttle flight with my HT.
I tried to make contact to them through sarex, but there were a whole lot of other people trying at higher power.
A great book to get is ARRL's Satelite Handbook. With a homemade groundplane antena and perhaps an inexpensive preamplifier you could be hearing
a lot with your HT!!
Have Fun

Walt

KD6VYV

1743. Re: Ham-Space Digest V94 #300

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 06:35:07 UTC
From: sphillip@nyx10.CS.du.EDU
Message-ID: <Pine.SUN.3.90.941028003459.29862D-100000@nyx10>
Source record: 26595

```
unsubscribe ham-space
```

1744. Re: RS-10 and license classes

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 07:38:03 UTC
From: n2oto@aol.com
Message-ID: <38q9or$j40@newsbf01.news.aol.com>
Source record: 26596

In article <35sj04$al3@solaris.cc.vt.edu>, billkuhn@vtaix.cc.vt.edu (Bill Kuhn) writes:

It is OK for you to use RS-10 with a no code licence. You are only txing on two meters! Call AMSAT if you are still not sure! 73 Rupert

1745. RUSSIAN MILITARY SATELLITES

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 15:51:44 UTC
From: Tyler Harpster <TJH112@psuvm.psu.edu>
Message-ID: <94301.115144TJH112@psuvm.psu.edu>
Source record: 26599

Does anybody know anything about listening to russian military satellites?
ANy frequencies or info would be appreciated.
tyler.

1746. Ham-Space Digest...Address to Subscribe?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 17:05:32 UTC
From: miles@mail.utexas.edu
Message-ID: <miles-2810941205150001@klingon.util.utexas.edu>
Source record: 26597

Can someone post the address for subscribing (and un-subbing)? Thank you.

1747. International Recommendations

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 17:29:24 UTC
From: nguyen@ddwilson.gsfc.nasa.gov
Message-ID: <38rcdk$6r6@paperboy.gsfc.nasa.gov>
Source record: 26598

Code 500 at Goddard Space Flight Center has established an Online Information Server (OLIS) to allow remote users browsing current Blue Books and Green Books through Internet. These Recommendations have been prepared by the Consultative Committee for Space Data Systems (CCSDS).

The OLIS provides many access and retrieval methods (e.g., WAIS, FTP, Gopher, Mosaic). Regardless of platform used (e.g., Mac, PC, Unix), a remote user can download text file of various CCSDS Blue Books and Green Books. Postscript format of these documents is also available for remote user who does not have the same word processing application software that was used to create the original document.

Document in its native format (e.g., Word) can also be retrieved.

You can ftp or run gopher to ddwilson.gsfc.nasa.gov, or
Open URL to http://ddwilson.gsfc.nasa.gov/CCSDS-A.html.

--

Diem Nguyen e-mail: nguyen@ddwilson.gsfc.nasa.gov
DNGUYEN on GSFCMAIL
Loral AeroSys voice: 301-794-2563 (office)
7375 Executive Place fax: 301-794-7208
Seabrook, MD 20706 USA

1748. [Q] Shareware Windows trackers

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 19:39:08 UTC
From: crossfir@eskimo.com
Message-ID: <CyEELD.Gx9@eskimo.com>
Source record: 26600

I apologize for the newbie question, but I just joined a couple of days ago, and I wonder if there is a shareware Windows satellite/shuttle tracking program available? I'm looking at both STSPLus and PC Trak, but I'd like a Windows program that I can check at work during the day, leaving it running all the time. I saw a post about WinSat, but I don't know anything about it. Thanks for your time.

BTW, can anyone send me the FAQ for this newsgroup? Thanks again.

LaCier
crossfir@eskimo.com
(HAM license is inthe mail)

1749. Re: Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-28 23:20:25 UTC
From: n7ryw@teleport.com
Message-ID: <38s0vp$cr8@desiree.teleport.com>
Source record: 26601

In article <CyCoEC.3A3@freenet.carleton.ca>, ag845@FreeNet.Carleton.CA (Darryl Millson) says:
>
>
> Hello, I'm a 'year-old ham' and am interested in receiving satellite
>images (eg. weather) and contacts. Could someone give me some information
>on what type of antenna's to make(or buy) and what i need in terms of
>radio equipment and software to run on my 486? At present I have a 2m
>handheld and a bunch of dusty radio-shack scanners! I realize that there
>is a lot of info I need to catch up on, but any help you can offer will
>point me in the proper direction. Thank you for your help everyone! 73's

We could go on here for weeks, and only scratch the surface, so I'll refer you to a book, Satellite Experimenters Handbook. Available from good Ham stores and mail order.

Weather satellites are an entirely different service. Try Weather Satellite Handbook, same sources.

Have fun!

Bill, n7ryw@teleport.com
Scholls, OR

1750. Re: Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-29 15:26:37 UTC
From: moritz@ipers1.e-technik.uni-stuttgart.de
Message-ID: <38tpjd$2sns@info2.rus.uni-stuttgart.de>
Source record: 26604

Here some advices, to get started quickly:

1) get a satellite tracking program from an FTP site, get
the orb. data from the Newsgroup, and tune one of your scanners
to 137.620 MHz or 137.750 (not sure on the 2nd one) for the NOAA
satelites. Use an out door antenna though.

2) When you receve a good sig, get the program JVFAX, ver. 7,
and a faxconverter. (there are some vy simple designs around,
also for the WX sats, the JVFAX manual might help).

3) Once it works, you might want to use a proper antenna (eg.
turnstile) and a preamp...

Have fun, Moritz DL5UH

1751. Tracking the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 14:38:10 UTC
From: asirene@ntuvax.ntu.ac.sg
Message-ID: <1994Oct30.223810.1@ntuvax.ntu.ac.sg>
Source record: 26605

I am trying to track the MIR spacecraft. I have managed to
obtain the elements file but am now wondering which software
will compute the passes for me. Can anyone recommend some?

73,
RSM

1752. Re: Balloon Launch materials needed

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 15:20:54 UTC
From: mgarrett@prairienet.org
Message-ID: <390dkm$kpe@vixen.cso.uiuc.edu>
Source record: 26606

In a previous article, w4qo@peach.america.net (James C. Stafford) says:

>
> Looking to launch a weather balloon for high school science class. I
>have seen all kinds of radiosonde packages on the surplus market when i
>wasn't looking for one, but now I can't seem to find any. Any ideas on
>this and the balloon. I think I can come up with the transmitter, etc,
>but all those temp sensors and pressure sensors, I would rather find
>packaged. I did see a nice sized balloon in Edmonds for about $17 but I
>think there might be even better deals in the surplus market.
>
>Also, any contacts of hams who are doing this routinely would help.
>Thanks and 73,
>Jim W4QO 404-993-9500
>
>
>
>

Hi Jim:
Probably the best person in the field would be to contact Bill Brown, WB8ELK
since he keeps abrest of what works and what does not. You can contact him
directly at wb8elk@delphi.com and tell him KA9SZX sent you.
He will also have a list of people in your area who can help you too.
Good luck in your project
P.S. Bill only checks into his account every so often so you may have to
wait a few days.
--
Mark Garrett mgarrett@firefly.prairienet.org
KA9SZX @ N9LNQ.#ECIL.IL.USA.NA

1753. Re: Tracking the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 16:02:33 UTC
From: lisansky@strauss.udel.edu
Message-ID: <390g2p$l0v@strauss.udel.edu>
Source record: 26607

I use Traksat. Works great. When Traksat says it's supposed to be there,
it is.
Terry

--
Terry Lisansky (lisansky@strauss.udel.edu)
Give me a fast ship.....
For I intend to go in harms way.

1754. Satellite elements

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 17:28:57 UTC
From: timothy@indy.net
Message-ID: <CyHxwB.BMK@indy.net>
Source record: 26608

Is there someone out there that could post some satellite elements?

1755. Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 18:10:40 UTC
From: asirene@ntuvax.ntu.ac.sg
Message-ID: <1994Oct31.021040.1@ntuvax.ntu.ac.sg>
Source record: 26609
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

Hi,

Can anyone tell me the minimum requirement to work the MIR.
I am using a 7/8 lambda Diamond F-22 vertical mounted on roof. Also
using IC-22A on 145.550 MHz with 10watts output. Is this sufficient
to work the MIR? The last pass we tried was about 440km nearest.

Tried for abt 50 minutes about the 3 minute window. No QRM
or obstructions but QSO either. Would appreciate any help. Would a
YAGI be necessary?

73,
RSM

1756. Re: Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 20:30:17 UTC
From: billv@olympus.net
Message-ID: <billv.75.001481DE@olympus.net>
Source record: 26513

In article <783566826snz@myth.demon.co.uk> zeus@myth.demon.co.uk (Mike Cowgill) writes:
>From: zeus@myth.demon.co.uk (Mike Cowgill)
>Subject: Re: Getting Started on Satellites HELP!
>Date: Mon, 31 Oct 1994 01:27:06 +0000

You can can also ftp FAQSAT.TXT from the ARRL info site.They can be retrieved
from oak.oakland.edu pub/hamradio/arrl/infoserver
Or if you only have e-mail you can send mail to info@arrl.org, in the body of
the text it should contain only the file name then quit on a seperate line. In
this case; send faqsat.txt
quit
There you go, that should do you.

1757. Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 20:38:55 UTC
From: gkennedy@helix.net
Message-ID: <Yp$ikClgn6iJ055yn@helix.net>
Source record: 26610

Hello All !!!

I am looking for an MS-DOS based satellite tracking program which
will produce a tabular prediction *text file* output for "visible" passes.

There is one hitch.....the output, in addition to AOS/LOS times and
Alt/Az info, *** MUST contain the ORBIT NUMBER for each pass. ***

I have tried STSPLUS and TRACKSAT, and neither of these give me that
information in their "analytical" modes....

I need this information to assist me in cataloging of NOAA imagery I
am now receiving. Right now I am entering this information manually
(and it takes a fair chunk of time!), but I want to automate the process
in the very near future.

Is there anything from, say, AMSAT which does this ?? If so, how can
I get my grubby little hands on it ?? <GRIN>

Thanks in advance.

Geoff L. Kennedy
gkennedy@helix.net

1758. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-30 23:06:27 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.32.00171C3C@teleport.com>
Source record: 26514
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <1994Oct31.021040.1@ntuvax.ntu.ac.sg> asirene@ntuvax.ntu.ac.sg writes:
>From: asirene@ntuvax.ntu.ac.sg
>Subject: Contacting the MIR. Help!
>Date: 31 Oct 94 02:10:40 +0800

> Can anyone tell me the minimum requirement to work the MIR.
>I am using a 7/8 lambda Diamond F-22 vertical mounted on roof. Also
>using IC-22A on 145.550 MHz with 10watts output. Is this sufficient
>to work the MIR? The last pass we tried was about 440km nearest.

The antenna is the exact opposite of what you want. The F-22 (and all gain
verticals) get their gain by concentrating the signal toward the horizon.
The problem is that MIR is UP, not at the horizon! Don't feel alone, when
I worked at HRO, this would happen with someone once a day at least.

Try an antenna called a "Crossed Dipole". I used one for years for MIR
and Sarex. It points up toward the satellites. For a good description, look
in the Satellite Experimenters Handbook for it.

1759. Re: VITA --- Remember Pacsat

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 00:48:00 UTC
From: ericr@access1.digex.net
Message-ID: <ericr.783564205@access1>
Source record: 26511

hays@silver.networx.com (John Hays) writes:

>Hey --- When the original PACSAT design was being tossed around, I attended
>a meeting in Lowell, MA area to discuss the design and the project was going
>to be allied with VITA (?) ---

>Does anyone have contacts with this agency (Volunteers In Technical
>Assistance - ???) ...

>Please respond via email.

>John KD7UW

VITA has done a lot since then! We "sponsored" the Digital Communications
Experimenot on the UoSAT-2 (UO-11) satellite. We then were involved in
the development of the Pacsat Communications Experiment on UoSAT-3
(UO-14), which still operates as a non-amateur store and forward
satellite for VITA.

We're now in the next phase of the satellite project, where we will
launch our own satellite at the end of the year.

Any more questions, please ask!

Eric WD3Q

--
Eric Rosenberg WD3Q, EI4VPS, YJ0AER, J20BY, etc.
Volunteers In Technical Assistance voice: +703-276-1800
1600 Wilson Blvd., Suite 500 fax: +703-243-1865
Arlington, VA 22209 USA ericr@access.digex.com
ericr@vita.org

1760. Re: Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 01:27:06 UTC
From: zeus@myth.demon.co.uk
Message-ID: <783566826snz@myth.demon.co.uk>
Source record: 26512

In article <38s0vp$cr8@desiree.teleport.com>
n7ryw@teleport.com "William Roth" writes:

> We could go on here for weeks, and only scratch the surface, so I'll refer
> you to a book, Satellite Experimenters Handbook. Available from good Ham stores
> and mail order.
>
> Weather satellites are an entirely different service. Try Weather Satellite
> Handbook,
> same sources.

Excellent advice. If those books get you hooked then you could do worse than
join Amsat (don't have the US address). In the meantime, tune your 2m FM
receiver to 145.825 and listen for Dove DO-17 (I haven't been following it
recently so it may be temporarily off again).

Mike.

1761. ARLK048 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 14:49:58 UTC
From: w1aw@arrl.org
Message-ID: <$arlk048.1994@ampr.org>
Source record: 26515
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK048
ARLK048 Keplerian data

ZCZC SK16
QST de W1AW
Keplerian Bulletin 48 ARLK048
From ARRL Headquarters
Newington, CT October 29, 1994
To all radio amateurs

SB KEP ARL ARLK048
ARLK048 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-66
1 99966U 94307.76579162 .00051270 00000-0 16849-3 0 26
2 99966 56.9997 196.6306 0011659 276.4103 83.5649 15.89544561 27
AO-10
1 14129U 83058B 94289.48195497 -.00000348 00000-0 10000-3 0 3242
2 14129 26.8030 302.7931 6025932 219.6206 75.3706 2.05881540 57313
RS-10/11
1 18129U 87054A 94296.82750190 .00000030 00000-0 15809-4 0 9751
2 18129 82.9278 233.7494 0012616 32.3157 327.8768 13.72342956367557
UO-11
1 14781U 84021B 94297.55816061 .00000164 00000-0 35570-4 0 7486
2 14781 97.7837 306.2174 0010935 212.7582 147.2946 14.69258306569302
RS-12/13
1 21089U 91007A 94296.90862597 .00000035 00000-0 21199-4 0 7478
2 21089 82.9198 275.9827 0030714 109.1284 251.3205 13.74048290186325
AO-13
1 19216U 88051B 94296.51481754 .00000031 00000-0 10000-4 0 9861
2 19216 57.6901 224.2175 7239723 353.1389 0.7191 2.09721162 17205
UO-14
1 20437U 90005B 94297.26306677 .00000025 00000-0 26654-4 0 476
2 20437 98.5853 20.2521 0010944 168.2396 191.9042 14.29859371248033
AO-16
1 20439U 90005D 94297.24379376 .00000025 00000-0 26807-4 0 8458
2 20439 98.5943 21.6074 0011259 168.9779 191.1652 14.29913373248048
```

```
DO-17
1 20440U 90005E 94297.74526568 .00000036 00000-0 30723-4 0 8467
2 20440 98.5953 22.4711 0011369 167.0324 193.1147 14.30053610248138
WO-18
1 20441U 90005F 94297.72295175 .00000028 00000-0 27940-4 0 8494
2 20441 98.5950 22.4399 0011831 167.2575 192.8906 14.30027062248133
LO-19
1 20442U 90005G 94296.71284624 .00000025 00000-0 26396-4 0 8446
2 20442 98.5959 21.7332 0012251 169.9797 190.1635 14.30124958248002
FO-20
1 20480U 90013C 94297.32778939 -.00000021 00000-0 19633-4 0 7422
2 20480 99.0582 64.8687 0541320 47.0318 317.4875 12.83227529220691
AO-21
1 21087U 91006A 94295.78420499 .00000094 00000-0 82657-4 0 5313
2 21087 82.9453 48.2791 0036850 87.7998 272.7376 13.74545924187118
UO-22
1 21575U 91050B 94297.23560024 .00000046 00000-0 30056-4 0 5510
2 21575 98.4246 9.0517 0006856 267.5444 92.4955 14.36937429171612
KO-23
1 22077U 92052B 94298.23934878 -.00000037 00000-0 10000-3 0 4442
2 22077 66.0877 7.6884 0015322 255.9647 103.9671 12.86288415103510
KO-25
1 22828U 93061F 94298.19750665 .00000028 00000-0 28923-4 0 3208
2 22828 98.6393 12.7082 0009972 171.5956 188.5405 14.28070732 24330
KO-25?
1 22830U 93061H 94296.72685150 .00000096 00000-0 55864-4 0 3494
2 22830 98.5409 7.1050 0010220 158.1055 202.0576 14.28067954 56048
IO-26
1 22826U 93061D 94298.21701205 .00000040 00000-0 33981-4 0 3412
2 22826 98.6417 12.7030 0008759 186.3937 173.7130 14.27743790 56249
AO-27
1 22825U 93061C 94298.24553362 .00000009 00000-0 21431-4 0 3437
2 22825 98.6433 12.6764 0008311 184.0983 176.0129 14.27638387 56248
PO-28
1 22829U 93061G 94298.20539440 .00000034 00000-0 31172-4 0 3350
2 22829 98.6401 12.7349 0009988 172.0963 188.0381 14.28045910 56252
Mir
1 16609U 86017A 94297.85977163 .00009819 00000-0 13720-3 0 8252
2 16609 51.6469 257.4031 0002342 164.3054 195.8016 15.57548508496222

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
November 1, 1994, at 2230z on Baudot and AMTOR.
NNNN
/EX
```

1762. Re: Any info on OSCAR-21 - is it still sick?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 15:41:34 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.33.000FB1D2@teleport.com>
Source record: 26520

In article <1994Oct31.123831.1@lpopsb> donovan@lpopsb.mayo.edu writes:
>From: donovan@lpopsb.mayo.edu
>Subject: Any info on OSCAR-21 - is it still sick?
>Date: 31 Oct 94 12:38:31 -0500

>Hello,

>I saw a post awhile back stating that
>oscar-21 was sick...anyone have any follow-up
>info on the bird????

AO-21 (RS-14) is off the air. The host satellite, Informator-1, had reached the end of its intended life, and the command station was unwilling to maintain the bird due to budget problems. There is a small amount of hope from those who were directly involved with RS-14 that something might be worked out to have Informator be able to provide some power.

That was the last I heard. Lets hope that something can be done!

1763. AO-27 Questions

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 16:31:04 UTC
From: dmart@cnj.digex.net
Message-ID: <199410311631.AA05765@cnj.digex.net>
Source record: 26516

Does anyone have any information about AO-27. I have worked this satellite when it was operating in amateur mode J. What is this used for in the commercial service? What modulation techniques are used. I assume that the frequencies are near the 430 and 2 meter amateur bands. Any information would be appreciated.

Dave Marthouse
Internet: dmart@cnj.digex.net n2aam@bagg.overleaf.com

1764. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 16:33:00 UTC
From: neill.p.taylor@aea.ORGn.UK
Message-ID: <9410311632.AA28871@fusrs3b.culham.aea.orgn.uk>
Source record: 26517

Geoff L. Kennedy wrote:
> I am looking for an MS-DOS based satellite tracking program which
>will produce a tabular prediction *text file* output for "visible" passes.
>
> There is one hitch.....the output, in addition to AOS/LOS times and
>Alt/Az info, *** MUST contain the ORBIT NUMBER for each pass. ***

The program GSTP, available from AMSAT-UK, will do what you want.

Neill G4HLX

Dr. Neill P. Taylor UKAEA Government Division
Fusion
D3 Culham, Abingdon,
Oxfordshire OX14 3DB, UK.
Internet: neill.p.taylor@aea.orgn.uk
AMPRnet: g4hlx@g4hlx.ampr.org
AX.25 BBS: G4HLX@GB7SDN.#49.GBR.EU

1765. Any info on OSCAR-21 - is it still sick?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 17:38:31 UTC
From: donovan@lpopsb.mayo.edu
Message-ID: <1994Oct31.123831.1@lpopsb>
Source record: 26518

Hello,

I saw a post awhile back stating that
oscar-21 was sick...anyone have any follow-up
info on the bird????

Thanks,

Dave Donovan
KB0NLA

1766. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 19:55:48 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Oct31.195548.844@ke4zv.atl.ga.us>
Source record: 26519
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <n7ryw.32.00171C3C@teleport.com> n7ryw@teleport.com (William Roth) writes:
>In article <1994Oct31.021040.1@ntuvax.ntu.ac.sg> asirene@ntuvax.ntu.ac.sg writes:
>> Can anyone tell me the minimum requirement to work the MIR.
>>I am using a 7/8 lambda Diamond F-22 vertical mounted on roof. Also
>>using IC-22A on 145.550 MHz with 10watts output. Is this sufficient
>>to work the MIR? The last pass we tried was about 440km nearest.
>
>The antenna is the exact opposite of what you want. The F-22 (and all gain
>verticals) get their gain by concentrating the signal toward the horizon.
>The problem is that MIR is UP, not at the horizon! Don't feel alone, when
>I worked at HRO, this would happen with someone once a day at least.
>
>Try an antenna called a "Crossed Dipole". I used one for years for MIR
>and Sarex. It points up toward the satellites. For a good description, look
>in the Satellite Experimenters Handbook for it.

Unfortunately, this is bad advice. An analysis of all possible passes
for a LEO sat shows that it will spend the majority of the time you
are in it's footprint at an angle of less than 30 degrees above the
horizon. The turnstyle over a groundplane advocated in the SEH has
a *null* at those angles. For a non-steerable antenna, a simple
quarterwave vertical works better (at least 3db better, usually more).
It has a null straight up, but the sat will spend a very short time
directly overhead, and path loss is least during that period. During
the low part of passes (below 20 degrees), a gain vertical can be very
useful. This was reported in the AMSAT Journal a few years ago, but the
SEH hasn't been updated. A better non-steerable antenna is the Lindenblad.
It offers a flattened hemispheric coverage with circular polarization.
CP is a big advantage due to spin modulation on most sats, I highly
recomend building one of these if you aren't going to be using steerable
antennas. (I haven't analyzed the new "eggbeater" style antennas, but I
expect they're better than crossed dipoles too.) The only time the crossed
dipole has the edge is in direct overhead passes. Those are relatively rare,
and the amount of time the sat is directly over any given spot is a very
short time compared to the total time you'll be in it's footprint.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1767. 2M NBFM SAT - WHICH ONE?

Newsgroup: rec.radio.amateur.space
Date: 1994-10-31 22:09:00 UTC
From: tom.alldread@kbsbbs.com
Message-ID: <9410311820361458@kbsbbs.com>
Source record: 26522

Greetings All:

On Oct 6/94 we picked up a NBFM downlink as we were motoring
along the transCanada highway in Manitoba. We were scanning two metres
and ran across the downlink in the 145 MHz segment of the band. It was
interesting to monitor stations from all over the U.S.A. working a
Canadian VE5 station. The downlink was full quieting!

Can anyone identify which satellite we picked up.

Very Best Regards,

T.M. Alldread,R.R.#4,Site 430,C7,Courtenay, BC,V9N-7J3
INTERNET: tom.alldread@kbsbbs.com Tel:(604)337-5577

---
* CmpQwk #UNREG* UNREGISTERED EVALUATION COPY

1768. why are elements published for...

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 01:25:27 UTC
From: larson@loren.net.com
Message-ID: <3945e7$gmo@unet.net.com>
Source record: 26521

I noticed that elements are published for ARSENE, 22828, POSAT, HUBBLE, GRO, and UARS.

I know what Hubble, GRO, and UARS are, but don't know why I would want to track them? Any hints of what I might be missing from them?

I remember ARESNE, but didn't think there was much that most would want to track. I thought it had problems -- was it recovered when I was not looking (hopefully!).

I plead ignorance on 22838 and POSAT. I would find any information about them interesting.

So, what am I missing up there with these?

Thanks,

Alan

1769. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 04:14:01 UTC
From: wdunckel1@aol.com
Message-ID: <394fa9$ffh@newsbf01.news.aol.com>
Source record: 26523

In article <1994Oct31.195548.844@ke4zv.atl.ga.us>, gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>Unfortunately, this is bad advice. An analysis of all possible passes .....etc etc etc,

Not only the above, but the Mir is curently plagued with battery problems. Although they operate their radio occasionaly, they are not able to operate on any kind of schedule. I hear that next year (with help from space shuttle maybe) they may be able to fix this problem. You may get lucky though!

Walt KD6VYV

1770. Re: why are elements published for...

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 09:51:36 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.34.0009DC75@teleport.com>
Source record: 26528

In article <3945e7$gmo@unet.net.com> larson@loren.net.com (Alan Larson) writes:
>From: larson@loren.net.com (Alan Larson)
>Subject: why are elements published for...
>Date: 1 Nov 1994 01:25:27 GMT

> I noticed that elements are published for ARSENE, 22828, POSAT,
>HUBBLE, GRO, and UARS.

These are mostly done automatically from lists, and I suspect that Arsene was never removed when it died. 22828 is listed because Norad keeps getting it confused with KO-25. In fact, 22828 elements are currently KO-25, but both are sent because Norad might get the problem straightened out at any time.

Posat is the same situation as Arsene. I don't know why the Observatories are in these. Maybe it is because they are easily visible at the right time?

1771. Re: 2M NBFM SAT - WHICH ONE?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 09:54:59 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.35.0009EAEC@teleport.com>
Source record: 26529

In article <94103118203614 58@kbsbbs.com> tom.alldread@kbsbbs.com (Tom Alldread) writes:
>From: tom.alldread@kbsbbs.com (Tom Alldread)
>Subject: 2M NBFM SAT - WHICH ONE?
>Date: Mon, 31 Oct 1994 22:09:00 GMT

>Greetings All:

> On Oct 6/94 we picked up a NBFM downlink as we were motoring
>along the transCanada highway in Manitoba.

It was AO-21 on 2 meters. Unfortunately, it was soon after turned off. For a similar satellite, try AO-27 during the day on 436.800, and the Russian Space Station MIR on 145.550.

1772. WWW and FTP available

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 09:59:39 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.36.0009FED2@teleport.com>
Source record: 26531

I have put up an Amateur Satellite WWW page and FTP space. The addresses are:

Anonymous FTP- ftp.teleport.com/users/n7ryw/

WWW Page URL- http://www.teleport.com/~n7ryw/asatpage.html

Be sure to get the " ~ "(tilde) character in the URL at n7ryw!

I have Wisp and updates, KctDrv, Wintel, and DSP-12 software, as well as some news and other stuff.
Enjoy!

1773. Re: why are elements published for...

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 12:47:46 UTC
From: hrsblackwell@stars.gsfc.nasa.gov
Message-ID: <hrsblackwell-0111940747460001@macgwy-mac2.gsfc.nasa.gov>
Source record: 26524

In article <3945e7$gmo@unet.net.com>, larson@loren.net.com (Alan Larson) wrote:

> I noticed that elements are published for ARSENE, 22828, POSAT,
>HUBBLE, GRO, and UARS.
>
> I know what Hubble, GRO, and UARS are, but don't know why I would
>want to track them? Any hints of what I might be missing from them?
>
> I remember ARESNE, but didn't think there was much that most would
>want to track. I thought it had problems -- was it recovered when I
>was not looking (hopefully!).
>
> I plead ignorance on 22838 and POSAT. I would find any information
>about them interesting.
>
> So, what am I missing up there with these?
>
> Thanks,
>
> Alan
Alan,

I suspect these are included because they are contained within the standard set of elements that originate from NORAD. Other entities such as AMSAT separate out various birds into different categories (i.e., separate out the Ham Radio Sats) and provide different files for
these. Also, some people just like to know where these other sats are either for professional
or general curiousity (e.g., I wonder what that moving star was overhead last night ?).

Just my opinion
--
Jim Blackwell
Goddard High Resolution Spectrograph Science Support
Computer Sciences Corporation
NASA/GSFC Code 681.0
Greenbelt, MD 20771

1774. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 15:10:53 UTC
From: zlau@arrl.org
Message-ID: <1994Nov1.151053.6310@arrl.org>
Source record: 26526
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

Gary Coffman KE4ZV (gary@ke4zv.atl.ga.us) wrote:
: In article <n7ryw.32.00171C3C@teleport.com> n7ryw@teleport.com (William Roth) writes:
: >In article <1994Oct31.021040.1@ntuvax.ntu.ac.sg> asirene@ntuvax.ntu.ac.sg writes:
: >> Can anyone tell me the minimum requirement to work the MIR.
^^^^^^^
: Unfortunately, this is bad advice. An analysis of all possible passes
: for a LEO sat shows that it will spend the majority of the time you
: are in it's footprint at an angle of less than 30 degrees above the

Gary's inappropriate and lengthy analysis deleted.

Gary's analysis makes sense if you are interested maximizing the
time you can work MIR, as opposed to just working them once.

Advantages of the MIR overhead:
Minimum path loss--shortest distance, fewer obstructions
Good possibility of low background noise
If you are in Hawaii or someplace similar
the competition is out of range.
Minimal doppler

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

1775. Satellite frequencys

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 15:22:18 UTC
From: timothy@indy.net
Message-ID: <CyLHD7.8KE@indy.net>
Source record: 26525

Can someone post or tell me where I can find satellite frequencys, beacon frequencys, and mode schedules?
-N9VHM

1776. Keplerian data for NOAA birds

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 18:31:20 UTC
From: drangmei@ll.mit.edu
Message-ID: <1994Nov1.183124.16343@ll.mit.edu>
Source record: 26527

Where can I get Keplerian elements for NOAA-11, NOAA-12, NOAA-13 weather satellites on the net?

-Rick D.
(drangmei@ll.mit.edu)

1777. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 19:27:15 UTC
From: sufana@ceco.ceco.com
Message-ID: <CyLspG.JHF@ceco.ceco.com>
Source record: 26530

Geoff,

QUIKTRAK from AMSAT will print out orbit numbers or you can put it to a file.

Hope this helps.

73s, Charlie AJ9N sufana@ceco.ceco.com

1778. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 19:36:37 UTC
From: little@iamu.chi.dec.com
Message-ID: <3965c5$95k@nntpd.lkg.dec.com>
Source record: 26532

Geoff L. Kennedy wrote:
|> I am looking for an MS-DOS based satellite tracking program which
|>will produce a tabular prediction *text file* output for "visible" passes.
|>
|> There is one hitch.....the output, in addition to AOS/LOS times and
|>Alt/Az info, *** MUST contain the ORBIT NUMBER for each pass. ***

The ORBIT program by N3EMO does what you want. It should be available at
the various FTP sites. If not, let me know and I can send you a copy.

73,
Todd
N9MWB

1779. Re: why are elements published for...

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 19:44:50 UTC
From: clifford@festival.ed.ac.uk
Message-ID: <CyLtIr.H05@festival.ed.ac.uk>
Source record: 26533

Alan Larson (larson@loren.net.com) wrote:
: I noticed that elements are published for ARSENE, 22828, POSAT,
: HUBBLE, GRO, and UARS.

: I know what Hubble, GRO, and UARS are, but don't know why I would
: want to track them? Any hints of what I might be missing from them?

: So, what am I missing up there with these?

Some of us follow them visually too.

regards,

Neil

--

INTERNET: clifford@festival.ed.ac.uk <> JANET: N.T.Clifford@uk.ac.ed
---

1780. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-01 23:57:58 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov1.235758.7561@ke4zv.atl.ga.us>
Source record: 26537
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <1994Nov1.151053.6310@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
>Gary Coffman KE4ZV (gary@ke4zv.atl.ga.us) wrote:
>: In article <n7ryw.32.00171C3C@teleport.com> n7ryw@teleport.com (William Roth) writes:
>: >In article <1994Oct31.021040.1@ntuvax.ntu.ac.sg> asirene@ntuvax.ntu.ac.sg writes:
>: >> Can anyone tell me the minimum requirement to work the MIR.
> ^^^^^^^
>: Unfortunately, this is bad advice. An analysis of all possible passes
>: for a LEO sat shows that it will spend the majority of the time you
>: are in it's footprint at an angle of less than 30 degrees above the
>
>Gary's inappropriate and lengthy analysis deleted.

I'm sorry you choose to reject AMSAT's best advice (it's not my
analysis, the work was done by brighter and more capable people
than me).

>Gary's analysis makes sense if you are interested maximizing the
>time you can work MIR, as opposed to just working them once.

AMSAT's analysis makes sense if you want to maximize your chances
of working MIR, or SAREX, or any other body in LEO, *at all*.
Direct overhead passes are rare, and MIR's operation schedule in
particular is currently erratic. Using an antenna system that
favors the majority of time you'll be in the footprint will
maximize your chance of working them *once*.

>Advantages of the MIR overhead:
> Minimum path loss--shortest distance, fewer obstructions
> Good possibility of low background noise

Neither of these are of much concern at 145.55 MHz. The signals
are quite strong, even near the horizon, if the antenna used
doesn't place a null there. Background noise, aside from local
manmade noise, simply doesn't enter into the picture. This is
not extreme weak signal work.

> If you are in Hawaii or someplace similar
> the competition is out of range.

This is true, but has little to do with the type of antenna
used. Competition is a concern in the continental US or over
Europe, but competition ism't much of an issue in Hawaii or
Singapore (as is the case here). There will be relatively
few competing stations in the footprint since it will be
mostly over empty ocean, or over areas with low amateur

populations.

And an antenna optimized solely for the overhead pass does *not* reduce interference from competition. Unless they too are using strictly overhead optimized antennas, they can be anywhere in the footprint and still put a good signal up to the satellite. You will only be able to put a good signal up at one time at one point. So using an antenna optimized solely for the overhead pass will reduce your competitive chance of getting a signal in edgewise.

> Minimal doppler

In point of fact, doppler is changing most rapidly during the overhead portion of the pass as range and bearing from your station are changing most rapidly. Doppler changes are much less during the lower inclination parts of the pass.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1781. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 02:16:55 UTC
From: little@iamu.chi.dec.com
Message-ID: <396sqn$p74@nntpd.lkg.dec.com>
Source record: 26534
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <1994Oct31.195548.844@ke4zv.atl.ga.us>, gary@ke4zv.atl.ga.us (Gary Coffman) writes:

|> The only time the crossed
|>dipole has the edge is in direct overhead passes. Those are relatively rare,
|>and the amount of time the sat is directly over any given spot is a very
|>short time compared to the total time you'll be in it's footprint.

In addition, when the bird is close to being directly overhead, it is also as close as it is going to get, i.e. minimal path loss, so you don't need as much gain. So as Gary suggests, an antenna with a closer to the horizon pattern where you need the gain is a better bet.

73,
Todd
N9MWB

1782. Satellite to Internet Access?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 04:51:55 UTC
From: jls@capedata.iii.net
Message-ID: <3975tu$esl@nic.iii.net>
Source record: 26535

Can anyone tell me if there is a program or script written to link
a satellite packet to an internet node?

Jeffery Stutzman/N1LUY
Buzzards Bay, Ma.
MANU TENERE MARE SUPREMUS

1783. APT-Satellites: Report NOV 01, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 08:41:42 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-021194084429@oskar.gmd.de>
Source record: 26411

```
Observed at station 50.7 NLat, 7.1 ELon, NOV 01, 1994

NOAA-9: APT 137.62 On
NOAA-10: APT 137.50 *OFF*
NOAA-11: APT 137.62 Burst on, no image
NOAA-12: APT 137.50 On
Meteor 2-21: APT 137.85 *OFF*
Meteor 3-5: APT 137.85 On
Okean 1-7: APT 137.40 *OFF*

Okean 1-7 was quiet during all available passes. There is
not much hope that we will see regular APT-service. Imaging
of NOAA-11 is dead. NOAA-10 APT is off due to VHF-conflict
with NOAA-12. BTW: Good opportunity for visual observations
of spacestation MIR from europe - passed Cassiopeia yesterday
NOV 01, 16h50'51" UT brighter than mag 1.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

1784. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 18:13:33 UTC
From: greg@core.rose.hp.com
Message-ID: <CynJyM.8x0@icon.rose.hp.com>
Source record: 26536
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

Zack Lau (KH6CP) (zlau@arrl.org) wrote:
: Gary's analysis makes sense if you are interested maximizing the
: time you can work MIR, as opposed to just working them once.
:
Sorry, Zack, but I have to agree with Gary. In my experience working RS-10 over the past few years, a simple vertical antenna works best. I use a home-brew 5/8 J-pole most of the time, with 10-30 watts. On really bad passes (close to the horizon) I switch over to a 5 element beam aimed at the horizon. In the 50+ contacts made, I've experienced a high angle dropout once or twice, when the satellite was *right* overhead (89.something degrees). Those happen very rarely, and the dropout lasted less than a minute.

The problem with working satellites is that they're like the proverbial potato chips - once you've worked them you're hooked! The best advice is to get a setup which will maximize longer term enjoyment of this aspect of the hobby.

Now, for the original question - I believe I read in SpaceNews that MIR has had some power supply problems recently. There was a statement that one of the inhabitants was only on the air occasionally over Europe, which I extrapolate to there not being any ham activity over the rest of the planet. Your antenna and radio may be working just fine, but it takes two for a QSO. Be patient; they'll get things working again on their end. In the mean time, you might try some of the other Low Earth Orbit satellites - RS-10 or AO-27 would be good candidates (for phone; I'm not up on packet sats yet).

Greg KD6KGW

1785. Re: AO-27 Questions

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 18:32:11 UTC
From: greg@core.rose.hp.com
Message-ID: <CynKtn.94n@icon.rose.hp.com>
Source record: 26544

Dave Marthouse (dmart@cnj.digex.net) wrote:
: Does anyone have any information about AO-27. I have worked this
: satellite when it was operating in amateur mode J. What is this
: used for in the commercial service? What modulation techniques are
: used. I assume that the frequencies are near the 430 and 2 meter
: amateur bands. Any information would be appreciated.

I'm confused too. I worked it a few months ago on phone, 2m up / 70cm down.
These past two weekends it seemed like they were doing packet. Are they doing
an FO-20 type of schedule (alternate phone & packet every week or so)?
With AO-21 out, I expect this bird will get much more attention.

Greg KD6KGW

1786. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 20:25:20 UTC
From: zlau@arrl.org
Message-ID: <1994Nov2.202520.15240@arrl.org>
Source record: 26538
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
: In article <1994Nov1.151053.6310@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
: >Gary Coffman KE4ZV (gary@ke4zv.atl.ga.us) wrote:
: >: In article <n7ryw.32.00171C3C@teleport.com> n7ryw@teleport.com (William Roth) writes:
: >: >In article <1994Oct31.021040.1@ntuvax.ntu.ac.sg> asirene@ntuvax.ntu.ac.sg writes:
: >: >> Can anyone tell me the minimum requirement to work the MIR.
: > ^^^^^^^
: >: Unfortunately, this is bad advice. An analysis of all possible passes
: >: for a LEO sat shows that it will spend the majority of the time you
: >: are in it's footprint at an angle of less than 30 degrees above the
: >
: >Gary's inappropriate and lengthy analysis deleted.

: I'm sorry you choose to reject AMSAT's best advice (it's not my
: analysis, the work was done by brighter and more capable people
: than me).

The fundamental problem with the analysis
is it doesn't answer the question,
which I also forgot to answer....

*** Can I work MIR with what I have? ***

*** Yes, I think people have even done it with a handheld transceiver **

: > Minimal doppler

: In point of fact, doppler is changing most rapidly during the
: overhead portion of the pass as range and bearing from your
: station are changing most rapidly. Doppler changes are much
: less during the lower inclination parts of the pass.

I stand corrected on this point.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

1787. Freqs to hear NASA commentary?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 22:40:01 UTC
From: ai@iol.ie
Message-ID: <3994g1$dpp@barnacle.iol.ie>
Source record: 26539

I asked this before and got a nice reply from the people at Goddard but I seem to have lost the info during changeoer from one PC to another.

I believe the Goddard Radio Club retransmits NASA auio Shuttle link on HF 3Mhz - 14 MHz.
Does anyone have the exact frequencies to hand please (for STS66 Nov 3)?
Thanks.

--
David Moore BSc FRAS, Editor of "Astronomy & Space" magazine.
(ai@iol.ie) Chairman, Astronomy Ireland, P.O.Box 2888, Dublin 1.
Tel: +353-1-459 8883. Fax: +353-1-459 9933.
_____Irish News: 1550-111-442 (calls cost upto 58p/minute)_____
_____U.K.: 0891-88-1950 (39p/min cheap, 49p/min all other times)_____

1788. SAT Freqs as requested

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 23:20:17 UTC
From: arbee@teleport.com
Message-ID: <3996rh$go@elaine.teleport.com>
Source record: 26416

```
COMMON SATELLITE FREQUENCIES LISTINGS
MAY 1993 UPDATE

00965:TRANSIT 5BN 5 :136.650 NAVIGATION
02608:ATS-1 :135.555,135.575,135.600 COMMUNICATION
:135.625,135.645,137.350 COMMUNICATION
03029:ATS-3 :137.37,137.350 COMMUNICATION
04320:AO-5 :29.450,144.05 AMATEUR *1
06236:AO-6 :29.450 AMATEUR *1
06909:OSCAR 20 :149.9875,399.9680 NAVIGATION
07530:AO-7 :29.502,145.975,435.100 AMATEUR *1
08366:GOES 1 :136.380 WEATHER
10061:GOES 2 :136.380 WEATHER
10637:IUE :136.860 EXPLORER
10703:AO-8 :29.402,435.095 AMATEUR *1
10953:GEOS 3 :136.380 WEATHER
11054:GPS-03 :1227.600 NAVIGATION
12458:NOVA I :149.9875,399.9680 NAVIGATION
12544:METEOSAT 2 :137.078 WEATHER
12553:NOAA 7 :137.620 WEATHER *1
13010:MARECS-A :137.170 GEOSTATIONARY
13362:NOVA III :149.9875,399.9680 NAVIGATION
13367:LANDSAT 4 :137.860 EARTH RESOURCES
13386:MARECS-B2 :137.170 GEOSTATIONARY
13923:NOAA 8 :137.500 WEATHER *1
14129:AO-10 :145.810,145.989,436.020 AMATEUR
:436.040 AMATEUR
14189:GPS-08 :1227.600 NAVIGATION
14372:COSMOS 1500 :137.400,466.500 OCEANOGRAPHIC
14781:UO-11 :145.825 AMATEUR
15039:GPS-09 :1227.600 NAVIGATION
15271:GPS-10 :1227.600 NAVIGATION
15427:NOAA 9 :137.620,137.770 WEATHER
15936:OSCAR 30 :149.9875,399.9680 NAVIGATION
16129:GPS-11 :1227.600 NAVIGATION
16609:MIR :121.125,121.750,130.165 SPACE STATION
:139.205,143.625,145.500 SPACE STATION
:145.550,145.900,231.000 SPACE STATION
:233.000,247.000,249.000 SPACE STATION
:417.000,463.000 SPACE STATION
16969:NOAA 10 :137.500,136.770 WEATHER
17066:COSMOS 1791 :150.000,400.00 NAVIGATION
17070:POLAR BEAR :149.9875,399.9680 NAVIGATION
18122:RS 10/11 :29.357,29.403,145.857 AMATEUR
```

(COSMOS 1861) :145.903,29.403,29.453 AMATEUR
:145.907,145.953 AMATEUR
18312:METEOR 2-16 :137.400 WEATHER
18361:OSCAR 27 :149.9875,399.9680 NAVIGATION
18362:OSCAR 29 :149.9875,399.9680 NAVIGATION
18820:METEOR 2-17 :137.300 WEATHER
19070:OSCAR 23 :149.9875,399.9680 NAVIGATION
19071:OSCAR 32 :149.9875,399.9680 NAVIGATION
19215:METEOSAT 3 :137.080 WEATHER
19216:AO-13 :145.8125,145.975,435.650 AMATEUR
:435.675,145.950,145.955 AMATEUR
19223:NOVA II :149.9875,399.9680 NAVIGATION
19336:METEOR 3-2 :137.850 WEATHER
19419:OSCAR 25 :149.9875,399.9680 NAVIGATION
19420:OSCAR 31 :149.9875,399.9680 NAGIGATION
19531:NOAA 11 :137.620,137.770 WEATHER
19802:GPS BII-01 :1227.600 NAVIGATION
19826:COSMOS 2004 :149.940,399.840 NAVIGATION *1
19851:METEOR 2-18 :137.300 WEATHER
20045:COSMOS 2006 :149.970,399.920 NAVIGATION *1
20061:GPS BII-02 :1227.600 NAVIGATION
20185:GPS BII-03 :1227.600 NAVIGATION
20302:GPS BII-04 :1227.600 NAVIGATION
20305:METEOR 3-3 :137.850 WEATHER
20361:GPS BII-05 :1227.600 NAVIGATION
20437:UO-14 :435.070 AMATEUR
20438:UO-15 :435.120 AMATEUR
20439:PO-16 PACSAT :437.025,437.050 AMATEUR
20440:DO-17 DOVE :145.825 AMATEUR
20441:WO-18 WEBERSAT :437.075,437.105 AMATEUR
20442:LO-19 LUSAT :437.155,437.125 AMATEUR
20452:GPS BII-06 :1227.600 NAVIGATION
20480:FO-20 :435.910,435.795 AMATEUR
20508:NADEZHDA 2 :150.000,400.00 NAVIGATION
20577:COSMOS 2074 :149.910,399.760 NAVIGATION *1
20670:METEOR 2-19 :137.850 WEATHER
20724:GPS BII-08 :1227.600 NAVIGATION
20788:FENGYUN 1B :137.795 WEATHER
20826:METEOR 2-20 :137.850 WETHER
20830:GPS BII-09 :1227.600 NAVIGATION
20959:GPS BII-10 :1227.600 NAVIGATION
21087:AO-21 :145.985,145.825,145.950 AMATEUR
:145.8375,145.800 AMATEUR
21089:COSMOS 2123 :150.000,400.00 NAVIGATION
21089:RS 12/13 :29.408,29.454,145.915 AMATEUR
:145.960,29.458,29.504 AMATEUR
:145.865,145.910 AMATEUR
21130:COSMOS 2135 :149.970,399.920 NAVIGATION *1
21152:NADEZHDA 3 :150.000 NAVIGATION
21230:COSMOS 2142 :150.030,400.080 NAVIGATION

21232:METEOR 3-4 :137.300 WEATHER
21263:NOAA 12 :137.500,136.770 WEATHER
21552:GPS BII-11 :1227.600 NAVIGATION
21575:UO-22 :435.120 AMATEUR
21578:SARA :145.955 ???????
21655:METEOR 3-5 :137.850 WEATHER
21666:COSMOS 2154 :149.940,399.840 NAVIGATION *1
21796:COSMOS 2173 :149.970,399.920 NAVIGATION
21798:DMSP B5D2-6 :137.500,136.770 WEATHER (MILITARY)
21875:COSMOS 2180 :149.940,399.840 NAVIGATION
21890:GPS BII-12 :1227.6 NAVIGATION
21902:COSMOS 2181 :150.000,400.000 NAVIGATION
21930:GPS BII-13 :1227.6 NAVIGATION
21937:COSMOS 2184 :149.910,399.760 NAVIGATION
21975:COSMOS 2190 :149.940,399.840 NAVIGATION
21980:COSMOS 2191 :150.000,400.000 NAVIGATION
22006:COSMOS 2195 :149.970,399.920 NAVIGATION
22014:GPS BII-14 :1227.6 NAVIGATION
22077:KITSAT A :435.175 AMATEUR
22078:SSO/T :137-139 ??
22108:GPS BII-15 :1227.6 NAVIGATION
22161:FREJA :400.550 AURORA RESEARCH
22207:COSMOS 2218 :149.940,399.840 NAVIGATION
22231:GPS BII-16 :1227.6 NAVIGATION
22275:GPS BII-17 :1227.6 NAVIGATION
22319:SOYUZ TM-16 :121.125,121.750,130.167 MANNED FLIGHT
:139.208,143.625,231.000 MANNED FLIGHT
:233.000,247.000,249.000 MANNED FLIGHT
:417.000,463.000 MANNED FLIGHT
22446:GPS BII-18 :1227.6 NAVIGATION
22487:COSMOS 2233 :150.030,400.080 NAVIGATION
:ARSENE :145.975,2446.540 AMATEUR
22490:SCD-1 :401.620,401.650 WEATHER
22530:PROGRESS TM-16 :166.000,165.000,922.755 SUPPLYSHIP

*1 No longer transmitting. Kept for reference.

NOTE: Here are some FLTSATCOM Frequencies reported to be in use. These
frequencies are either DATA or VOICE or both.

244.0950 261.6500 262.2500 269.0700
248.9000 261.6750 262.3000 269.4750
249.5500 261.7000 262.4750 269.5500
250.4500 250.5500 259.7000 261.9000
262.5500 269.8000 261.4500 261.9500
262.9500 269.9500 261.4750 262.1000
263.6250 288.0000 261.5250 262.2250
264.9000 295.0750 261.6000
-END-

This list was on a packet bbs about a year ago, hope some of you find it useful and/or interesting.. Note that the update was 1993, might someone have a later list? Also, if you have a sat and freq that doesnt appear on this list, why not ad it to the list (in brackets) and re-UL it to the group, I know that myself and others would appreciate it! enjoy!

John Jordan KB7VZL

arbee@teleport.com

--
arbee@teleport.COM

1789. Re: Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-02 23:52:32 UTC
From: gkennedy@helix.net
Message-ID: <6p1kkClgnMSD055yn@helix.net>
Source record: 26413

In article <38tpjd$2sns@info2.rus.uni-stuttgart.de>, you wrote:
> Here some advices, to get started quickly:
>
> 1) get a satellite tracking program from an FTP site, get
> the orb. data from the Newsgroup, and tune one of your scanners
> to 137.620 MHz or 137.750 (not sure on the 2nd one) for the NOAA
> satelites. Use an out door antenna though.

The second one should read 137.500 MHz.....

One other thing that you will have to keep in mind. The IF bandpass
of most scanners is too narrow (15 KHz?) for NOAA APT work. You need
about 40 KHz to get the best results. This is because the signals are
modulated to about +/- 17 KHz.....add a few KHz for doppler.....

> 2) When you receve a good sig, get the program JVFAX, ver. 7,
> and a faxconverter. (there are some vy simple designs around,
> also for the WX sats, the JVFAX manual might help).

Yup....look for the AM demodulator part.....

> 3) Once it works, you might want to use a proper antenna (eg.
> turnstile) and a preamp...
>
> Have fun, Moritz DL5UH

It IS fun....and darned addictive !!! :-))) If I could get paid
for it (I get images and send them to a BBS here in Vancouver) it could
easily be a second job....<GRIN>.

1790. Re: Getting Started on Satellites HELP!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 01:04:00 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Cyo2yp.MwH@netcom.com>
Source record: 26540

Darryl Millson (ag845@FreeNet.Carleton.CA) wrote:

: Hello, I'm a 'year-old ham' and am interested in receiving satellite
: images (eg. weather) and contacts. Could someone give me some information
: on what type of antenna's to make(or buy) and what i need in terms of
: radio equipment and software to run on my 486? At present I have a 2m
: handheld and a bunch of dusty radio-shack scanners! I realize that there
: is a lot of info I need to catch up on, but any help you can offer will
: point me in the proper direction. Thank you for your help everyone! 73's

Another excellent publication to consider is:

WeatherSat Ink
c/o Bluebird Greenhouses
4821 Jessie Dr.
Apex, N.C. 27502

Published quarterly on each solstice or equinox, $18 yearly.

Multifax 6.0 software/hardware, modified Bearcat 145 or equivalent scanner, must have at least 50khz bandwidth for full 256 grey-scale capability. I use a steerable cross-yagic with "Hamtronics" preamp.--The Multifax demodulator hardware is also GOES WEFAX capable.

Bill Eareckson
eareckso@netcom.com

1791. Re: Keplerian data for NOAA birds

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 01:08:04 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Cyo35G.CG@netcom.com>
Source record: 26541

drangmei@ll.mit.edu wrote:

: Where can I get Keplerian elements for NOAA-11, NOAA-12, NOAA-13 weather
: satellites on the net?

ftp: archive.afit.af.mil /pub/space

Bill Eareckson
eareckso@netcom.com

1792. Re: Satellite elements

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 01:14:32 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Cyo3G8.12E@netcom.com>
Source record: 26542

Timothy Toroni (timothy@indy.net) wrote:
: Is there someone out there that could post some satellite elements?

Try subscribing to: sci.space.news (Tom Kelso) posts them regularly there.

Also you can ftp: archive.afit.af.mil /pub/space.

I can post them but do not wish to duplicate what's already available unless
you guys don't have access to the above.

Bill Eareckson
eareckso@netcom.com

1793. Re: WTB: Ten-Tec Mode B Satellite Station

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 09:36:24 UTC
From: JJENSEN@VAX1.MANKATO.MSUS.EDU
Message-ID: <39aauo$1tp@nitrogen.mankato.msus.edu>
Source record: 26543

In article <39aanq$1tp@nitrogen.mankato.msus.edu>, JJENSEN@VAX1.MANKATO.MSUS.EDU (Joel Jensen, KF0VB) says:
>
>Wanted: Ten-Tec Mode B Satellite "Station" unit. I think these are
>still usable... Correct? I want to get on the "big birds" on the cheap...
>Thinking this might be a good start.
>
>(The LEO's are getting kind of ho-hum)
>
>73s, Joel.

1794. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 14:44:08 UTC
From: zlau@arrl.org
Message-ID: <1994Nov3.144408.13117@arrl.org>
Source record: 26545
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

Greg Dolkas KD6KGW (greg@core.rose.hp.com) wrote:
: Zack Lau (KH6CP) (zlau@arrl.org) wrote:
: : Gary's analysis makes sense if you are interested maximizing the
: : time you can work MIR, as opposed to just working them once.
: :
: Sorry, Zack, but I have to agree with Gary. In my experience working RS-10
: over the past few years, a simple vertical antenna works best. I use a
: home-brew 5/8 J-pole most of the time, with 10-30 watts. On really bad
: passes (close to the horizon) I switch over to a 5 element beam aimed at
: the horizon. In the 50+ contacts made, I've experienced a high angle dropout
: once or twice, when the satellite was *right* overhead (89.something degrees).
: Those happen very rarely, and the dropout lasted less than a minute.
: good candidates (for phone; I'm not up on packet sats yet).

According to my calculations, the minimum you need to work MIR
(height nominally 400 km) is 10 milliwatts to an antenna with 0
dBi gain straight up. I made the assumption that the astronaut
isn't an FM DXer, and isn't used to pulling weak FM signals out
of the noise (-118 dBm needed for a good signal)

Due to the increase in path loss, you need at least 15 dB more
signal when MIR is at the horizon. This assumes that you have
a clear horizon. When MIR is 8 degrees above the horizon, you
still need 11 dB more signal than when it is overhead.

Now, what does this mean in practical terms, since most people
run more than 10 milliwatts? It just means that you probably
have a 10 dB or so advantage if you are located in a good spot
as opposed to someone on the edge of the footprint. This is where
MIR is fundamentally different from RS-10. With RS-10, you can
still work people if you are 10 dB weaker than the strongest
stations. Signals 10 dB weaker in an FM receiver get covered up
completely.

A statistical analysis of possible MIR paths doesn't make
sense to me. If I wanted to work MIR I would look at the
actual paths and choose the best ones. Then I would make sure
my antenna and location was appropriate for the path. The
statistical analysis that might be useful is to analyze the
locations of stations that have worked people in space, to
see what places seem to have the edge.

If I was really serious I might even alter my travel plans
a little to give myself a better chance. After all,
traveling hundreds or thousands of miles for business

or vacation isn't unusual anymore. Personally, I'd rather
vacation in Hawaii than in New York City, even though it
is a longer trip that makes carrying a carload of stuff
difficult. Carrying something along to work MIR ought
to be easy compared to bringing something to worth through
Oscar 13.
--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

1795. Wanted: Info on geeking at sea via satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 18:43:34 UTC
From: hermit@cats.UCSC.EDU
Message-ID: <HERMIT.94Nov3104334@am.ucsc.edu>
Source record: 26418

We purchased a sailboat recently and plan to do some medium to long range cruising and would like to know if there's any way we can stay in touch with Usenet while we're gone.

I'm not currently a Ham but have been seriously considering it, and am not afraid of Morse Code.. I learned it in the Scouts but forgot it since then. So I'm willing to go pretty far to get licensed for this if necessary and am curious about serious amateur radio as a way of keeping in tocuh with the world while at sea. Are there any ways to get email and/or news via satellite while at sea? And the more difficult question (I would think) is how can I send back my replies?

I posted on rec.boats and it was suggested that I ask here. I'll try to keep an eye on the group for a response, but I would appreciate responses sent via email in addition to posting here in case it expires before I see it.

Thanks a lot for any help you may be able to provide!

--Bill.

--
William R Ward __o __o 1803 Mission St. #339
Bay View Software and Consulting _-\<,-\<,_ Santa Cruz CA 95060 USA
Voicemail +1 408/479-4072 (_)/---/ (_) hermit@cats.ucsc.edu
Call my tree-structured BBS: +1 408/457-1357 (300-14400 baud, 8/N/1)
(Finger hermit@ucscb.ucsc.edu for PGP public key)

1796. Re: Contacting the MIR. Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 19:59:41 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov3.195941.19324@ke4zv.atl.ga.us>
Source record: 26559
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.misc

In article <1994Nov3.144408.13117@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
>Greg Dolkas KD6KGW (greg@core.rose.hp.com) wrote:
>: Zack Lau (KH6CP) (zlau@arrl.org) wrote:
>: : Gary's analysis makes sense if you are interested maximizing the
>: : time you can work MIR, as opposed to just working them once.
>: :
>: Sorry, Zack, but I have to agree with Gary. In my experience working RS-10
>: over the past few years, a simple vertical antenna works best.
[snip]
>According to my calculations, the minimum you need to work MIR
>(height nominally 400 km) is 10 milliwatts to an antenna with 0
>dBi gain straight up. I made the assumption that the astronaut
>isn't an FM DXer, and isn't used to pulling weak FM signals out
>of the noise (-118 dBm needed for a good signal)

That's a pretty good assumption. That's a 0.28 microvolt signal at
the MIR crew's Japanese transceiver, assuming their external "vertical"
antenna's gain equals out with their feedline loss. (I don't have exact
figures on those two items.) That should give them something on the
order of 12 db of quieting in their receiver for a 10 mW uplink ERP.
Just 3 db more signal would give over 20 db of quieting thanks to the
FM effect. So an uplink ERP of 20 mW should deliver armchair copy for
the overhead pass.

>Due to the increase in path loss, you need at least 15 dB more
>signal when MIR is at the horizon. This assumes that you have
>a clear horizon. When MIR is 8 degrees above the horizon, you
>still need 11 dB more signal than when it is overhead.

So you'd need about 1.26 watts ERP at the horizon, or about 0.5 watt
ERP at 8 degrees elevation to deliver a 20 db+ quieting signal to
MIR. If our poster had a typical 4 watt HT (he doesn't, he has a
10 watt rig at a fixed station due to license restrictions), then
he'd have plenty of signal margin down to the horizon *if he weren't
penalized by an antenna putting a null at the horizon*.

>Now, what does this mean in practical terms, since most people
>run more than 10 milliwatts? It just means that you probably
>have a 10 dB or so advantage if you are located in a good spot
>as opposed to someone on the edge of the footprint. This is where
>MIR is fundamentally different from RS-10. With RS-10, you can
>still work people if you are 10 dB weaker than the strongest
>stations. Signals 10 dB weaker in an FM receiver get covered up
>completely.

But since our poster has a radio delivering 30 db more power than
you postulate, he can easily put a full quieting signal to the
horizon if he isn't penalized by a poor antenna choice. It's certainly
true that FM capture means that stations only 3 db stronger will
take over the receiver on MIR, but this isn't a power war DXer pileup
we're talking about. From his location, our questioner is going to
be nearly the only station in the footprint. If there *are* others,
they can take turns in an orderly manner *if their window is large
enough*. It won't be if they can only use the very few moments of
the overhead pass. If they can use the full 12 minutes of visibilty
available to them, their chances of a contact improve greatly.

>A statistical analysis of possible MIR paths doesn't make
>sense to me. If I wanted to work MIR I would look at the
>actual paths and choose the best ones. Then I would make sure
>my antenna and location was appropriate for the path. The
>statistical analysis that might be useful is to analyze the
>locations of stations that have worked people in space, to
>see what places seem to have the edge.

The problem with that idea is that MIR, and SAREX, operating
schedules are erratic and not under your control, while the
laws of celestial mechanics are fixed, and also not under your
control. You don't know that they will be operating during the
two minutes of the sole overhead pass you can reach on any given
day, or that you could win a power war with a station with thousands
of watts ERP if they were operating at that moment. You've got at
least six passes each day where you'll be in the footprint, for at
least 12 minutes in one case, if you can access them when they are
less than 30 degrees above the horizon. So your window of opportunity
for catching them on the air, and not being monopolized by an alligator,
is much larger if you don't concentrate on just the overhead pass.

>If I was really serious I might even alter my travel plans
>a little to give myself a better chance. After all,
>traveling hundreds or thousands of miles for business
>or vacation isn't unusual anymore. Personally, I'd rather
>vacation in Hawaii than in New York City, even though it
>is a longer trip that makes carrying a carload of stuff
>difficult. Carrying something along to work MIR ought
>to be easy compared to bringing something to worth through
>Oscar 13.

Well with current MIR operating habits you'd have to travel
to Europe, and compete with the guys with thousands of watts
ERP, since that's the only time MIR is currently operational
due to their power problems. That's supposed to be fixed soon,
and we should be able to go back to having leisurely QSOs
with the cosmonauts any time they are above our local horizon.
It normally helps if you speak fluent Russian, though right
now you'd do better to speak German. The cosmonauts typically
aren't DXers, and like to chat, if you speak their language.

With their aviation English, hello-goodbye type contacts are
all you can expect if you don't speak their language. Remember
the amateur radio gear is on MIR for *their* recreation, not
your award chasing. Respect that.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1797. AMRAD BBS Number

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 20:07:39 UTC
From: ROBERTSM@JSC.MIL
Message-ID: <seb8fced.011@JSC.MIL>
Source record: 26419

Does anyone have a number for the AMRAD BBS. The old number was
(703) 734-1387, but now it is a voice number.
Thanks, Mel W3MR robertsm@jsc.mil

1798. STS-66 Element Set (94307.894)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-03 22:31:16 UTC
From: elements-request@alsys.com
Message-ID: <STS-66.94307.894@alsys.com>
Source record: 26546
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-66
1 23340U 94073A 94307.89416744 .00051270 00000-0 16849-3 0 33
2 23340 56.9952 196.9769 0011025 276.3051 83.6778 15.89461684 45

Satellite: STS-66
Catalog number: 23340
Epoch time: 94307.89416744 = (03 NOV 94 21:27:36.06 UTC)
Element set: 003
Inclination: 56.9952 deg
RA of node: 196.9769 deg Space Shuttle Flight STS-66
Eccentricity: .0011025 Keplerian element set JSC-003
Arg of perigee: 276.3051 deg from NASA flight Day 1 vector
Mean anomaly: 83.6778 deg
Mean motion: 15.89461684 rev/day Gil Carman
Decay rate: 5.1270e-04 rev/day^2 NASA Johnson Space Center
Epoch rev: 4

This data is also available via the Shuttle Elements Mailing
List. For more information about the list and how to subscribe,
send a message to with only the command "info elements" in the
body of your message to "listserv@alsys.com".

--
--
Gary Morris Internet: garym@alsys.com
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
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1799. ANS-Bulletins and Kepler elements in this news group?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 10:07:22 UTC
From: Huub van Thienen <huub@cs.kun.nl>
Message-ID: <CyqMsB.ELF@sci.kun.nl>
Source record: 26547

When I began following this news group (about three months ago), there was a regular supply of AMSAT News Service Bulletins. However, I have not seen any for the last six weeks (the last one I received was sent on september 17). This is a bit dissapointing, as I appreciated these bulletins very much.

I can think of several explanations for this. Perhaps no bulletins have been posted to this news group since mid september, because there was no news concerning the birds circling around us. This is quite unlikely. Another explanation is that there is a regular stream of Bulletins coming out of AMSAT Head Quarters, but somehow none of these bulletins make their way to my site. This is much more likely, but frightening at the same time. If there are messages lost at some point, there must be much more that I am missing, of which I am even not aware. Finally, AMSAT may have limited the distribution of their bulletins to a part of the world in which I do not live (I am in the Netherlands). If this is the case, I would like to know an address of someone who is able to change this. Perhaps I can contact them and try to persuade them to include nl in their distribution.

A similar thing holds for orbital data. I have not seen Keplerian element sets since october 6. This information is perhaps even more valuable than the ANS bulletins, so I would like to see them here again too.

So, I would be grateful if someone could give me some information about the possible reasons for not seeing this vital information anymore.

Regards,
Huub van Thienen
huub@cs.kun.nl

1800. Omnidirectional Ant's

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 12:01:35 UTC
From: plove@powerup.com.au
Message-ID: <39d7qv$2hb@grissom.powerup.com.au>
Source record: 26548

Greetings All, I've always wanted to get involved in Amateur satelites , but the cost has always deterred me. However i've seen designs in ARRL H/book for "turnstile" antenna's. This would allow me to "get my feet wet" , but here's the question : Is there anyone out there ACTUALLY using such antenna's ? if so , could you please advice of their usefullness I don't have unrealistic expectations, I realise they won't perform like a yagi etc. but do they work , and what "birds' would I be best advised to use them on. I already have 2 metre SSb , no 70 cms yet , but if I saved on antenna's at the outset ..well 70 cms is a possibilty in near future. I'm only new on the "net" , so suppose these kind os postings may be common, so sorry 'bout that :-) , but thanks in advance to anyone who can give me the benefit of their experience. de vk4xd. vk4xd@vk4wia.bne.qld.aus.oc or Email plove@enterprise.powerup.com.au

1801. Re: Wanted: Info on geeking at sea via satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 15:47:43 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.37.000FCC1B@teleport.com>
Source record: 26420

In article <HERMIT.94Nov3104334@am.ucsc.edu> hermit@cats.UCSC.EDU (William R. Ward) writes:
>From: hermit@cats.UCSC.EDU (William R. Ward)
>Subject: Wanted: Info on geeking at sea via satellite
>Date: 03 Nov 1994 18:43:34 GMT

>We purchased a sailboat recently and plan to do some medium to long
>range cruising and would like to know if there's any way we can stay
>in touch with Usenet while we're gone.

There isn't an Amateur link via satellite to the Net. There are, however, many satellites that do data. Maybe someone at home can do the forwarding between for you.

I am in the middle of setting up a satellite link for my Catalina 30. I will be taking it to Hawaii next year, so it may take a while. I am on very new ground with this project!

BTW, the license to get on satellites (Technician) no longer requires Morse. The ones for HF still do, however.

Have fun!
Bill, n7ryw@teleport.com

1802. Re:Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 16:01:38 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.38.0010077E@teleport.com>
Source record: 26553

I have had exactly the same thoughts. There are some upper-ups who continually block this idea, however. The main objection is that countries outside the USA will not support Geo orbit sats. Presumably, they say this because they beleive that they would not be able to use it. This is extremely shortsighted, however.

As you mentioned, it would be possible for 3 birds to see 90% of the globe, so it would be a truly international project. I beleive that there are some other motivations for not supporting this idea, but there is a chance.

After Phase 3D, where do we go? The president of Amsat mentioned a Geo sat, though with the above objection. Maybe we could convince others that it would be a good idea? The elliptic sats were good, but it is time to get into the present with some Geo sats. This not, actually, a new idea. Arthur C. Clarke, in his original postulation about Geos, proposed three sats spaced around the globe and linked together.

I will probably be writing a piece for the Amsat Journal or ANS very soon, so I won't use up any more disk space here. Keep the faith!

See-Ya-Bye
Bill, n7ryw@teleport.com

1803. Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 17:54:55 UTC
From: jho@xilinx.COM
Message-ID: <199411041754.AA12059@clemenza.xilinx.com>
Source record: 26549

Hi there,

I'd like to share some of the thought with you guys on the net about the
futhre ham satellites. I always hear from satellite hams say that LEO sat
is easy to work and is good for a short contact. OSCAR-13 is good for DX and
long QSO and
however, it is not easy to work (expensive equipment and tracking etc) and
signal is always weak.

Since there are a lot of commerical geostationary
satellites on the orbits, is it possible that we hams can build reasonable
ERP small size transponders placing in the commericial satellites to share
some common facilities such as solar panels on the commercial sat platforms?
If this can be done, several ham sats can be linked so that a reliable world wide
ham sat network can be formed.

73,

JOnathan

1804. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 18:45:00 UTC
From: rargyle@cc.weber.edu
Message-ID: <4NOV199411454531@cc.weber.edu>
Source record: 26550

In article <9411031555.AA38739@dieter.hpcore>, kp40.117917@kodako.kodak.com (Mark Dieter) writes...
;>In article <Yp$ikClgn6iJ055yn@helix.net>, gkennedy@helix.net (Geoff L.
;>Kennedy) writes:
;>>
;>> I am looking for an MS-DOS based satellite tracking program which
;>> will produce a tabular prediction *text file* output for "visible"
;>> passes.
;>>
;>> There is one hitch.....the output, in addition to AOS/LOS times and
;>> Alt/Az info, *** MUST contain the ORBIT NUMBER for each pass. ***
;>>
;>InstaTrack available from AMSAT should do the trick. I cannot confirm
;>that orbit number is available, but I would be suprised if it weren't.
;>I don't have the phone number, but AMSAT is in Silver Springs MD. Try
;>information.
;>
;>
;>===
;>| Mark Dieter Eastman Kodak Rochester NY |
;>| (716)588-4639 kp40.117917@kodako.kodak.com |
;>===
;>
;>

Quicktrack will produce the desired output, InstantTrack does not.
Get both. Amsat's number is (301) 589-6062.
Bob kb7kcl

1805. Getting started

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 22:02:44 UTC
From: jls@capedata.iii.net
Message-ID: <39eb2n$bvs@nic.iii.net>
Source record: 26551

Just bought a new Yeasu FT-5200 (dualbander 2m/440 fm).
Bought it with the intention of getting into pacsat, but I am
quickly finding out that I don't have the proper equipment.
I have the following:

FT-5200
IBM PS2 L40 laptop (386)
KPC-3
Instatrak
Using Procomm+ for windows for comms

1. What else do I need?

2. Are there FM only satellites using 2m/440?

3. Any helpful tips?

Thanks.
Jeffery Stutzman/N1LUY
Buzzards Bay, Ma.
MANU TENERE MARE SUPREMUS

1806. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-11-04 22:56:23 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.783989783@eel>
Source record: 26552
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.info

From: tkelso@afit.af.mil (TS Kelso)
Subject: Two-Line Orbital Element Set: Space Shuttle
Date: 4 Nov 94 22:56:23 GMT
Organization: Air Force Institute of Technology
Message-Id: <tkelso.783989783@eel>

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 66
1 23340U 94073A 94308.25000000 -.00001004 10299-4 74990-5 0 48
2 23340 56.9905 195.3396 0010663 278.1287 318.8122 15.89577259 86
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1807. Re: Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-05 01:24:59 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov5.012459.25826@ke4zv.atl.ga.us>
Source record: 26554

In article <199411041754.AA12059@clemenza.xilinx.com> jho@xilinx.COM (Jonathan Ho) writes:
>Hi there,
>
>I'd like to share some of the thought with you guys on the net about the
>futhre ham satellites. I always hear from satellite hams say that LEO sat
>is easy to work and is good for a short contact. OSCAR-13 is good for DX and
>long QSO and
>however, it is not easy to work (expensive equipment and tracking etc) and
>signal is always weak.
>
>Since there are a lot of commerical geostationary
>satellites on the orbits, is it possible that we hams can build reasonable
>ERP small size transponders placing in the commericial satellites to share
>some common facilities such as solar panels on the commercial sat platforms?
>If this can be done, several ham sats can be linked so that a reliable world
>wide ham sat network can be formed.

Good idea, unfortunately the commercial geosat boys aren't interested
in letting us piggyback, and when AMSAT finally figured out what our
own geosat would cost, the gasp could be heard around the world. :-)
Looks like ham geosats will have to wait a while longer.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1808. Re: Omnidirectional Ant's

Newsgroup: rec.radio.amateur.space
Date: 1994-11-05 04:01:35 UTC
From: lkollar@nyx.cs.du.edu
Message-ID: <39f02v$nv5@nyx.cs.du.edu>
Source record: 26555

In article <39d7qv$2hb@grissom.powerup.com.au>,
Paul Love <plove@powerup.com.au> wrote:

>Greetings All, I've always wanted to get involved in Amateur satelites ,
>but the cost has always deterred me.

I never have figured out where all the rumors about satellite work being
expensive come from. Probably something to do with ad dollars. :-)
I've made satellite contacts using about $300 worth of equipment.

>However i've seen designs in ARRL
>H/book for "turnstile" antenna's. This would allow me to "get my feet wet"
>, but here's the question : Is there anyone out there ACTUALLY using such
>antenna's ?

Yup, I am. The Handbook doesn't give much advice about how to support
one of those critters, though. I use a 2'x2' piece of plywood for a base,
with L-brackets underneath to attach it to a 2x4. The elements are plain
copper wire, supported by cane poles (looks like bamboo). I coated the
cane & plywood with spar varnish, and it's held up well for three years
now. (This is a 10-meter antenna, by the way, for Mode A downlinks.)

Performance depends largely on how far above ground you mount it. From
the charts in the handbook, 3/8 wavelength is about ideal for satellite
work.

This kind of antenna is best for low-orbit satellites, namely RS-10 and
RS-12. SEDSAT will be going up in 1996, and it'll work there too.

--
Larry Kollar, KC4WZK | I like CW, but that doesn't mean I think every ham
lkollar@nyx.cs.du.edu | should have to learn it.
Crawling down the infobahn at 1200 baud...

1809. Re: FM reception on HT - any advice?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-05 09:15:49 UTC
From: Dave Mullenix <djmullen@facstaff.wisc.edu>
Message-ID: <39fig5$n52@news.doit.wisc.edu>
Source record: 26417

> I was wondering what the odds of picking up
> a FM 2meter downlink on a HT. I thought
> Oscar-21 would be possible but it appears
> there is conversation that it is sick now...
> are there any others...transmitting a strong
> enough signal (FM 2meters) to receive on an
> HT....lets assume a good pass also....
...
> Dave Donovan
> ddonovan@mayo.edu

Besides AO-27, already mentioned, try Dove on 145.825 MHz. Dove is currently sending a digitally synthesized voice saying, "Hi, this is Dove in space." and audio tones. It's also sending greetings and telemetry using standard 1200 baud packet. (And your HT can drive a standard packet TNC to display it.)

Mir and the Space Shuttle use 145.55. The next shuttle flight with amateur radio on it is in Feburary. Mir is having power problems, but the German guest astronaut was QSOing on 145.55 last week. I think he returned to earth yesterday, though.

Haf fun,
Dave, N9LTD

1810. WISP with KCT ??

Newsgroup: rec.radio.amateur.space
Date: 1994-11-05 14:17:02 UTC
From: rubenc@iglou.iglou.com
Message-ID: <1994Nov5.141702.18374@iglou.com>
Source record: 26412

Does anyone have a version of SATELLITE.DLL for WISP that will support
the Kansas City Tracker? When I try to activate the rotor, the whole thing
bombs out of windows. THe readme file says that a newer version of the file
may be needed for KCT, but I think this file archive was from 11/94.
Is anyone using WISP with a KCT yet?

CHarlie KB8BWE
rubenc@iglou.com
KB8BWE@N8LHG.#CIN.OH.USA

1811. ARLK049 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-11-05 19:32:01 UTC
From: w1aw@arrl.org
Message-ID: <$arlk049.1994@ampr.org>
Source record: 26556
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK049
ARLK049 Keplerian data

ZCZC SK17
QST de W1AW
Keplerian Bulletin 49 ARLK049
From ARRL Headquarters
Newington, CT November 5, 1994
To all radio amateurs

SB KEP ARL ARLK049
ARLK049 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-66
1 99966U 94307.76579162 .00051270 00000-0 16849-3 0 26
2 99966 56.9997 196.6306 0011659 276.4103 83.5649 15.89544561 27
AO-10
1 14129U 83058B 94289.48195497 -.00000348 00000-0 10000-3 0 3242
2 14129 26.8030 302.7931 6025932 219.6206 75.3706 2.05881540 57313
RS-10/11
1 18129U 87054A 94304.84748498 .00000052 00000-0 40142-4 0 9797
2 18129 82.9278 227.8238 0012238 11.2444 348.8979 13.72343549368650
UO-11
1 14781U 84021B 94302.05294378 .00000173 00000-0 37104-4 0 7495
2 14781 97.7836 310.5003 0011163 197.4661 162.6159 14.69260346569967
RS-12/13
1 21089U 91007A 94304.91867598 .00000041 00000-0 27063-4 0 7490
2 21089 82.9229 270.0396 0030770 88.3301 272.1381 13.74048713187425
AO-13
1 19216U 88051B 94301.75974551 -.00000432 00000-0 10000-4 0 9907
2 19216 57.6973 223.3019 7241598 353.4584 0.6898 2.09725736 17310
UO-14
1 20437U 90005B 94301.74159064 .00000055 00000-0 38476-4 0 480
2 20437 98.5848 24.6660 0011151 154.9063 205.2657 14.29860444248677
AO-16
1 20439U 90005D 94301.72214854 .00000041 00000-0 32895-4 0 8469
2 20439 98.5942 26.0271 0011408 155.6840 204.4885 14.29914275248681
```

```
DO-17
1 20440U 90005E 94302.22318218 .00000047 00000-0 34942-4 0 8478
2 20440 98.5955 26.8929 0011425 153.8182 206.3588 14.30054434248778
WO-18
1 20441U 90005F 94301.78113868 .00000045 00000-0 34428-4 0 8504
2 20441 98.5948 26.4461 0012038 155.2980 204.8780 14.30027892248710
LO-19
1 20442U 90005G 94305.24844492 .00000067 00000-0 42696-4 0 8469
2 20442 98.5955 30.1614 0012669 144.9499 215.2516 14.30126982249221
FO-20
1 20480U 90013C 94301.38190115 -.00000003 00000-0 62159-4 0 7430
2 20480 99.0587 68.1645 0541313 37.8580 325.9332 12.83227547221218
AO-21
1 21087U 91006A 94302.77226429 .00000094 00000-0 82657-4 0 5330
2 21087 82.9443 43.1073 0036920 69.0897 291.4205 13.74546026188072
UO-22
1 21575U 91050B 94301.69208760 .00000076 00000-0 40064-4 0 5526
2 21575 98.4237 13.4102 0006811 252.6805 107.3632 14.36938738172251
KO-23
1 22077U 92052B 94302.28239549 -.00000037 00000-0 10000-3 0 4457
2 22077 66.0874 359.2247 0015205 255.3725 104.5608 12.86288386104039
KO-25
1 22828U 93061F 94302.75169477 .00000064 00000-0 43326-4 0 3216
2 22828 98.6386 17.2108 0010173 158.1043 202.0575 14.28072014 24980
KO-25?
1 22830U 93061H 94301.21099194 .00000075 00000-0 47339-4 0 3509
2 22830 98.5407 11.4901 0011017 144.0378 216.1519 14.28068979 56687
IO-26
1 22826U 93061D 94302.70216330 .00000037 00000-0 32828-4 0 3428
2 22826 98.6415 17.1382 0008738 173.1615 186.9687 14.27744499 56880
AO-27
1 22825U 93061C 94302.73101488 .00000017 00000-0 24572-4 0 3444
2 22825 98.6393 17.1085 0008494 170.6233 189.5105 14.27639118 56886
PO-28
1 22829U 93061G 94302.75966162 .00000075 00000-0 47660-4 0 3366
2 22829 98.6396 17.2386 0010131 159.4323 200.7267 14.28047222 56902
Mir
1 16609U 86017A 94304.98133172 .00009913 00000-0 13777-3 0 8324
2 16609 51.6464 221.7235 0001875 196.3260 163.7673 15.57681518497336

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
Noveember 8, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

1812. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-05 22:04:52 UTC
From: gkennedy@helix.net
Message-ID: <vLfkkClgnovE055yn@helix.net>
Source record: 26557

In article <9410311632.AA28871@fusrs3b.culham.aea.orgn.uk>, Neill Taylor wrote:

> The program GSTP, available from AMSAT-UK, will do what you want.
>
> Neill G4HLX

Thank you for your reply. However, I get the feeling that I have to join AMSAT to be able to get this.....I don't really want to !!

Can I just get the software WITHOUT having to be a member ??

If it turns out that I have to join, what does membership "get" me (besides the stuff I'm after in the first place).....I'm not a Ham radio operator, so I don't have any real interest in those satellites. It also seems that it's a bit pricey.....somewhere I heard $80 US (or was that membership plus software ?).....is this a one-time fee, or is this the annual fee ?? If the latter, I had better have a darned good reason to pay that much for membership in a "club"......

Am I kornfused yet ?? :-))

Geoff L. Kennedy
gkennedy@helix.net

1813. Re: Getting started

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 03:04:51 UTC
From: Andrew Skattebo <askattebo@delphi.com>
Message-ID: <BAwVrBj.askattebo@delphi.com>
Source record: 26558

Jeffery L. Stutzman <jls@capedata.iii.net> writes:

>2. Are there FM only satellites using 2m/440?

Jeffery, I'm new to the group here and new to Delphi, but I thought I could get at least a partial answer to your posting. To answer your question, yes, there are several FM satellites available for digital use.I am looking at a list put out by AMSAT.
They list UO-22, KO-23 and KO-25 as primary FM digital birds. They all run 9600 baud however and unless your radio is already wired for it internally modifications are required along with a suitable 9600 baud modem add-on to your TNC. They also require specialized software to communicate. Also, check the frequency range of your rig, the downlink for these birds is from 436.5Mhz down to 435.12Mhz your radio might not cover these.
A wealth of beginner info on the pacsats is available from AMSAT.
"The Pacsat Beginner's Guide" call AMSAT 301-608-3410. They are a non-profit international club and would be happy to help.
73, Andy KA0SNL

1814. ARLS034 STS66 Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 03:40:53 UTC
From: w1aw@arrl.org
Message-ID: <$arls034.1994@ampr.org>
Source record: 26560
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB SPACE @ ARL $ARLS034
ARLS034 STS66 Keps

ZCZC AS78
QST de W1AW
Space Bulletin 034 ARLS034
From ARRL Headquarters
Newington, CT November 6, 1994
To all radio amateurs

SB SPACE ARL ARLS034
ARLS034 STS66 Keps

STS-66
1 23340U 94073A 94309.84327167 .00051270 00000-0 16849-3 0 41
2 23340 56.9950 187.9829 0013891 285.7412 74.2136 15.90299770 353

Satellite: STS-66
Catalog number: 23340
Epoch time: 94309.84327167 = (05 NOV 94 20:14:18.67 UTC)
Element set: 004
Inclination: 56.9950 deg
RA of node: 187.9829 deg Space Shuttle Flight STS-66
Eccentricity: .0013891 Keplerian element set JSC-004
Arg of perigee: 285.7412 deg from NASA flight Day 3 vector
Mean anomaly: 74.2136 deg
Mean motion: 15.90299770 rev/day Gil Carman
Decay rate: 5.1270e-04 rev/day sq NASA Johnson Space Center
Epoch rev: 35
Checksum: 323

Gil Carman, WA5NOM
NASA Johnson Space Center
NNNN
/EX
```

1815. Re: Freqs to hear NASA commentary?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 14:49:04 UTC
From: darrylb@delphi.com
Message-ID: <RozUrrg.darrylb@delphi.com>
Source record: 26421

Astronomy Ireland <ai@iol.ie> writes:

>I asked this before and got a nice reply from the people at Goddard but I
>seem to have lost the info during changeoer from one PC to another.
>
>I believe the Goddard Radio Club retransmits NASA auio Shuttle link on HF
>3Mhz - 14 MHz.
>Does anyone have the exact frequencies to hand please (for STS66 Nov 3)?
>Thanks.

This info is old, but may still be good.

WA3NAN: 3.860, 7.165, 14.295, 21.395, 28.650, 147.45
W5RRR: 3.850, 7.227, 14.280, 21.350, 28.495, 147.45
W6VIO: 14.270, 21.340, 224.04
K6MF: 3.840, 7.165, 145.58

All HF is SSB.
Hope this helps. 73's

1816. Re: WISP with KCT ??

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 14:57:00 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.42.000EF3A6@teleport.com>
Source record: 26422

In article <1994Nov5.141702.18374@iglou.com> rubenc@iglou.iglou.com (Charles A. Rubenstein) writes:
>From: rubenc@iglou.iglou.com (Charles A. Rubenstein)
>Subject: WISP with KCT ??
>Summary: none
>Keywords: none
>Date: Sat, 5 Nov 1994 14:17:02 GMT

>Does anyone have a version of SATELLITE.DLL for WISP that will support
>the Kansas City Tracker?

All versions should support the KCT/T. I have been running this combo for a long time.

For the newest version of satelite.drv, you can ftp from me at:

ftp.teleport.com/pub/users/n7ryw

I will put it there as a seperate file as soon as I am done with this. You may want to update other Wisp files, too, as I suspect you have a very old version. Tell me which versions you have first, as there are some other things that need to be done depending on the versions you have.

You can find this info from GSC in the Help...About box. Be sure to write down all of the program names and versions.

Mail the info to me at n7ryw@teleport.com

1817. My FTP and WWW URL

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 15:33:07 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.44.000F8DCF@teleport.com>
Source record: 26424

There have been some slight changes on exactly where logging into my FTP and WWW Page will land you, so here are the addresses:

For ftp- ftp.teleport.com/pub/users/n7ryw/

For WWW- http://www.teleport.com/~n7ryw/asatpage.html

I didn't have the /pub/ in the ftp before, as it wasn't supposed to be required. It is!

Bill, n7ryw@teleport.com

1818. School applying for SAREX

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 21:41:04 UTC
From: william@cortex.ama.ttuhsc.edu
Message-ID: <Pine.SUN.3.90.941106153512.27349C-100000@cortex>
Source record: 26415

Hello all,

Our middle school (grades 6-8) is in the process of writing a proposal for a SAREX contact with a future shuttle mission.

We have the necessary equipment & expertise available, as well as plenty of contacts with news media, so those parts of our proposal will be relatively easy to address.

I am working with the 6th & 7th grade science teachers, and principal to define how we will integrate aspects of amateur radio, and space science into the curriculum.

Has anyone here submitted a successful SAREX proposal? We already have fairly definite ideas on how we want to implement SAREX project at our school, but any contructive ideas on what 'works' and 'doesn't work' with middle school age kids would be useful to us. It would also help us know what the SAREX 'powers that be' would feel is important and non-important.

My EMail address is :

william@cortex.ama.ttuhsc.edu

Thanks,
William Biggs
KC5JIF

1819. Re: Solar radio emissions on FM?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-06 23:23:42 UTC
From: zjad49@trc.amoco.com
Message-ID: <CyvCzJ.H3C@trc.amoco.com>
Source record: 26423
Cross-posted to: sci.astro,rec.radio.amateur.space

OK, here's a wild idea for people to consider:

I know amateur radio enthusiasts can bounce signals off
the moon with fairly modest antennas (meaning antennas that can fit
in a North American's back yard), and get enough gain that they
can *talk* real time to each other that way. Thus the signal to noise
ratio must not be too bad.

In Geophysics there is an entire science built around using
weak sources to explore. For example, "vibroseis" which has replaced
dynamite as a seismic source for many purposes. Basically you get a
big metal plate attached to a heavy truck and shake it up and down. It
doesn't put out nearly as much of an impulse as dynamite does, but
that's OK, because you can keep wiggling it for 30 seconds or even
longer, with a known waveform. (Vibroseis was originally invented
to allow recording in places like urban Los Angeles, where dynamite
could not be used for obvious reasons.) The vibroseis waveform is
designed to crosscorrelate with itself into a nice spike. (Most people
use frequency sweeps, but others have used "Guassian noise" with some
success as well.) When you crosscorrelate the recorded "noise" with the
source waveform, magically a seismic section appears that is nearly the
same as could have been recorded with dynamite. In fact, it can be better
because you can tune the vibroseis waveform to put more energy in
frequency bands where you need it.

Vibroseis is old hat these days. More recently, some outfits
have begun to use the thumping sounds a drill bit makes while a hole
is being dug as a seismic source. The signal to noise ratio in that case
is just atrocious, but since the drill bit keeps thumping along for a
looooooonnnng time and you can record the thumps as it makes them, you
can generate a seismic section from such data too if you're willing to
cross-correlate with enough "noise".

This got some of us thinking... if an amateur can *TALK*
real time bouncing signals off the moon, how big an antenna would you
need to look for near-Earth asteroids, if you were willing to broadcast
for hours or days at a time and cross correlate with a looooonnnnnggg
source waveform? It seems to me some of the same sort of equipment
developed for SETI might be able to do this. With the plummeting price
of computer power and memory, would such an experiment be within an
amateur radio astronomer's reach?

Would there be some equivalent of the passive seismic experiments
as well? What about using the Sun's or Jupiter's radio emissions as the
cosmic equivalent of a thumping drill bit? Or some manmade broadcast, like

a military early-warning radar?
--
/\ /\ /\/\/\/\/\/\/\.-.-.-.-.......__________
/ \ / \ /Amoco Production Research Tulsa Oklahoma\/\/\.-.-....__
___/ \/ \/Joe A. Dellinger Internet: joe@sep.stanford.edu \/\.-.__
-------------- Uh oh, Toto, I think we're back in Kansas! ----------------------

1820. Re: Wanted: Info on geeking at sea via satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 01:41:06 UTC
From: zeus@myth.demon.co.uk
Message-ID: <784172466snz@myth.demon.co.uk>
Source record: 26425

In article <n7ryw.37.000FCC1B@teleport.com>
n7ryw@teleport.com "William Roth" writes:

>There isn't an Amateur link via satellite to the Net. There are, however, many
>satellites that do data. Maybe someone at home can do the forwarding between
>for you.

Two way data via Inmarsat is *very* expensive. We are talking around $/KB
ratios. There is a company that do broadcast UseNet (at 1200bps compressed)
via satellite but I can't remember their name :-(. They do have a couple of
newsgroups though if you fancy a trawl through the big list.

Mike.

1821. Re: Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 01:46:26 UTC
From: zeus@myth.demon.co.uk
Message-ID: <784172786snz@myth.demon.co.uk>
Source record: 26426

In article <199411041754.AA12059@clemenza.xilinx.com>
jho@xilinx.COM "Jonathan Ho" writes:

> I'd like to share some of the thought with you guys on the net about the
> futhre ham satellites. I always hear from satellite hams say that LEO sat
> is easy to work and is good for a short contact. OSCAR-13 is good for DX and
> long QSO and
> however, it is not easy to work (expensive equipment and tracking etc) and
> signal is always weak.

It is also due to hit the atmosphere in November '96. Let's hope P3D goes OK
and we get those big power transponders working.

> Since there are a lot of commerical geostationary
> satellites on the orbits, is it possible that we hams can build reasonable
> ERP small size transponders placing in the commericial satellites to share
> some common facilities such as solar panels on the commercial sat platforms?
> If this can be done, several ham sats can be linked so that a reliable world
> wide
> ham sat network can be formed.

Geosat builders charge BIG $$$$$$ for even small loads. And they don't like
amateur built (even if some of us are professionals for our day jobs)
electronics and antennae aboard. They also like to squeeze every mW of power
from the solar cells. Don't forget there arebig dB losses at the geostationary
distances and power levels we can use without big dishes. I think a nest of 3
geosats would get very boring very quickly. Amateur radio is all about
pushing the boundaries a bit. I would rather see a lunar orbit/lander or a
Mars probe (like was mooted for the core of P3D).

Mike.

--

Michael S. Cowgill (Mike) _ " ....Cracking toast Gromit!... "
zeus@myth.demon.co.uk (That's me) _ Royal Blue Dragon
G1VOX@GB7WRG.GBR.EU 44.131.2.76 _ -==(UDIC)==-

1822. Re: Getting started

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 01:54:38 UTC
From: zeus@myth.demon.co.uk
Message-ID: <784173278snz@myth.demon.co.uk>
Source record: 26427

In article <39eb2n$bvs@nic.iii.net>
jls@capedata.iii.net "Jeffery L. Stutzman" writes:

> Just bought a new Yeasu FT-5200 (dualbander 2m/440 fm).
> Bought it with the intention of getting into pacsat, but I am
> quickly finding out that I don't have the proper equipment.

For Pacsats you need SSB at 70cms. :-(

Mike.

1823. source of elements

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 05:56:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.269.2922@freddy.supernet.ab.ca>
Source record: 26428

Hi Timothy, yes there is a source for current satellite elements.
The nice part is its easy. Just send an email to amsatkep@drig.com
and the elements come automaticly to you email. You don't need to have
any body to the message, just the address will get the automatic email
good luck and have fun on the birds
73 de VE6LU Ernie

1824. why are elements published for...

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 06:08:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.270.2922@freddy.supernet.ab.ca>
Source record: 26429

Dear Alan,
These elements are the mathimatical values used in calculating the
positions of various satellites and other space bodys.
If you need more of an answer, (I'm not trying to be smart) go to the
library and get more info Ernie...

1825. Re: Solar radio emissions on FM?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 07:06:13 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov7.070613.5481@ke4zv.atl.ga.us>
Source record: 26436
Cross-posted to: sci.astro,rec.radio.amateur.space

In article <CyvCzJ.H3C@trc.amoco.com> zjad49@trc.amoco.com (Joe Dellinger) writes:
> OK, here's a wild idea for people to consider:
>
> I know amateur radio enthusiasts can bounce signals off
>the moon with fairly modest antennas (meaning antennas that can fit
>in a North American's back yard), and get enough gain that they
>can *talk* real time to each other that way. Thus the signal to noise
>ratio must not be too bad.

It's not that good unless at least one of the stations involved is
a "super" station. Usually, moonbouncers are excited to get a few
long dashes back off the moon. The path loss is really large, on
the order of 240-270 db depending on a variety of factors.

> In Geophysics there is an entire science built around using
>*weak* sources to explore. For example, "vibroseis" which has replaced
>dynamite as a seismic source for many purposes. Basically you get a
>big metal plate attached to a heavy truck and shake it up and down. It
>doesn't put out nearly as much of an impulse as dynamite does, but
>that's OK, because you can keep wiggling it for 30 seconds or even
>longer, with a known waveform. (Vibroseis was originally invented
>to allow recording in places like urban Los Angeles, where dynamite
>could not be used for obvious reasons.) The vibroseis waveform is
>designed to crosscorrelate with itself into a nice spike. (Most people
>use frequency sweeps, but others have used "Guassian noise" with some
>success as well.) When you crosscorrelate the recorded "noise" with the
>source waveform, magically a seismic section appears that is nearly the
>same as could have been recorded with dynamite. In fact, it can be better
>because you can tune the vibroseis waveform to put more energy in
>frequency bands where you need it.

This technique can be used on radio paths too. The Lowfer's, a group
of experimenters running low power radio in the 160-190 kHz band,
use a long term correlation technique to synthesize extremely narrow
filters. This allows them to get remarkable results with signals that
are well below the nominal noise floor of any conventional receiver.
The key to making this work is to know precisely the characteristics
and timing of the signal to be received. A single bit time may be
10 seconds or more, and each station uses a precise time reference
that is closely synchronized with the other station's reference.
This technique should be usable for moonbounce too, with allowances
made for doppler and libration.

> This got some of us thinking... if an amateur can *TALK*
>real time bouncing signals off the moon, how big an antenna would you
>need to look for near-Earth asteroids, if you were willing to broadcast
>for hours or days at a time and cross correlate with a looooonnnnnggg
>source waveform? It seems to me some of the same sort of equipment
>developed for SETI might be able to do this. With the plummeting price
>of computer power and memory, would such an experiment be within an
>amateur radio astronomer's reach?

I think the main problem would be the unknown doppler of the target.
Since the return echo will be frequency shifted an unknown, and
varying, amount, the correlator will be continually slipping phase.
There will be at least three sources of doppler. One will be due to
the rotation of the Earth, one due to the intrinsic velocity vector
of the target asteroid, and the final one due to the different
heliocentric velocities of both bodies. In principle, the first can
be compensated a priori, and the third can be controlled by looking
at only certain orbital volumes at any given time. The intrinsic
velocity for an unknown eccentric asteroid is going to be difficult to
deal with satisfactorily.

> Would there be some equivalent of the passive seismic experiments
>as well? What about using the Sun's or Jupiter's radio emissions as the
>cosmic equivalent of a thumping drill bit? Or some manmade broadcast, like
>a military early-warning radar?

That's an interesting idea. You need a precisely determinable source
in order for the correlator to lock phase. I'm not sure the Sun or Jupiter
would fit the criteria. Certainly, however, UHF TV sync signals would
do as a strong source. They are in the range of 5 million watts ERP,
and would paint the near horizon sky in a sweep controlled by the
Earth's rotation. Unfortunately, because there are several such
transmitters sharing the same frequency in the same hemisphere,
they are not precisely locked together, and TV sync signals are of
short duration (though precisely repetitive), there could be problems.
They'd be much more tractable than military radars, however.

A quick feasibility check would be to have an active moonbouncer
see if they can detect UHF TV sync pulses off the Moon without
special correlation. If they can, then using a correlator should
enhance the signals markedly. Obvious note: the TV station should
be over the moonbouncer's local horizon, else the direct signal would
dominate. A station that is also on satellite so timing correlation
is easily achieved for the sync pulses would be desirable. I'd
suggest WTBS Ch 17 in Atlanta as a possible source for experimenters.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1826. Freqs to hear NASA commentary?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 15:39:00 UTC
From: clint.bradford@ectech.com
Message-ID: <941108012416325@ectech.com>
Source record: 26430

A>Path: planet!isdnlin.mtsu.edu!darwin.sura.net!spool.mu.edu!howland.reston.ans
>From: ai@iol.ie (Astronomy Ireland)
>Newsgroups: rec.radio.amateur.space
>Subject: Freqs to hear NASA commentary?

There have been many requests for "where do I find the audio for the Shuttle" on the forum. As mentioned earlier, the Goddard Amateur Radio Club (Greenbelt, MD) re-transmits the audio on a number of HF frequencies, and a number of Amateur Radio repeaters throughout North America also place the Shuttle audio on their output. This system is called "NASA Select Audio", and is usually pulled from a satellite feed or other direct method. This service is available on non-DoD missions. On some launches a video feed is also available, which is then made available on some ATV (Amateur Television) repeaters.

I have summarized those feeds that I know about below, I would encourage you to let me know of any additions or changes that you know about. Keep in mind the list will change as repeaters add or drop the audio. Also, the audio will be present only when there is activity, which is not constant, especially at night. At other times you will probably hear other Hams chatting.

Minneapolis, MN 145.150
Minneapolis, MN 147.120 (WB0BQG/R)
Los Angeles, CA 145.460
Dayton/Columbus, OH 145.110 (WB4LA) (Very Wide Coverage)
Columbus, OH 443.700
Phoenix, AZ 449.000
Ashburn, GA 147.285 (South GA)
San Joaquin Valley, CA 52.220 (Bakersfield to Stockton)
Mountain View, CA 145.580 (NASA-Ames Research Center)
Houston, TX 146.640 (W5RRR) (Johnson Space Center)
Birmingham, AL 145.150 (N4AHN/R)
Birmingham, AL 145.380
Huntsville, AL 147.100 (Marshall Center Amateur RC)
Merrit Island, FL 146.940 (K4GCC/R) (Cape Canaveral area)
Tampa, FL 444.525
St. Petersburg, FL 444.725
Cedar Rapids, IA 146.400 (NN0V)

Amateur Television

San Francisco, CA 427.250 (Mt. Diablo, vert polarization)

HF Frequencies (May change, varies according to conditions)

3.860 MHz (US and Canada)
7.185 MHz (US and Canada)
14.295 MHz (Worldwide)
21.395 MHz (Worldwide)
28.650 MHz (Worldwide)

---
* QMPro 1.53 * Thesaurus: ancient reptile with an excellent vocabulary.

1827. AO-27's Back!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 18:23:07 UTC
From: greg@core.rose.hp.com
Message-ID: <CywtqJ.KKz@icon.rose.hp.com>
Source record: 26414

Well, it seems that AO-27 is back in the analog FM Repeater mode. I worked VE7VVW Ron (*) on Saturday afternoon; he had a really nice signal, subject to the characteristic AO-27 fade. "The Fade" is possibly my problem in not having a circular antenna, but the effect is that a signal will be Q9 one minute, and inaudible the next.

Having said that, I wasn't able to hear the bird on Sunday, so maybe it's schedule is still somewhat erratic.

Greg KD6KGW

(*) I've heard Ron for some time on several satellites, but it wasn't until Saturday that I understood he was Ron in Vernon, BC, instead of Vern in BC. :-)

1828. Where to get MacSat?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 19:30:23 UTC
From: tkreyche@zdlabs.ziff.com
Message-ID: <tkreyche-071194113023@tomkreyche.zdlabs.ziff.com>
Source record: 26431

I've looked all over the net and called Celestial BBS and can't find MacSat. Does anyone know where to get it? Also, the apple ftp site for ham radio is completely empty! What's the deal?

Thanks, Tom KG6YJ

1829. Q: MIR, current callsign?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 20:15:28 UTC
From: erik@peewee.chinalake.navy.mil
Message-ID: <39m1t1$66i@pandora.sdsu.edu>
Source record: 26432

I would like to know the current call for MIR.
Thanks

--
Erik van Bronkhorst Code C02313(474400D) erik@rftech.chinalake.navy.mil
KC6UUT CW/KotGT DoD#4342585443 AMA#438054

1830. Anyone receiving NOAA weather satellite transmissions

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 21:21:52 UTC
From: drangmei@ll.mit.edu
Message-ID: <1994Nov7.212156.13840@ll.mit.edu>
Source record: 26433

I am looking to build a image display section for NOAA APT format images.
Unfortunately, I don't currently have a receiver capable of aquiring the
satellite transmission (although I hope to get one in the not to distant
future).
In the mean time, I would love to get my hands on an audio cassette recording
of the 2400 Hz AM tone from a few satellite passes so that I can start working
on an image display unit.
If anyone is interested in helping me out it would be very much appreciated.
I would of course supply the cassette and pay postage to and from anywhere in
the US.

Thanx,
Rick D.
drangmei@ll.mit.edu
(617)981-3460

1831. Radio Meteor Obs Bulletin Oct 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 21:47:58 UTC
From: steyaert@vvs.innet.be
Message-ID: <steyaert.57.0015CCEF@vvs.innet.be>
Source record: 26447

Radio Meteor Observation Bulletin No. 15 November 1994

1. FORWARD SCATTER METEOR OBSERVATIONS

Observer: M. De Meyere
Location: Deurle, Belgium (3 37' E, 51 00' N)
Frequency: 66.17 MHz
Transmitter Locations:
Katowice, PR3, Poland, 65.99 MHz, 14 kW, Distance 1100 km
P. Neant, PR3, Romania, 66.17 MHz, 40 kW, Distance 1400 km
Czestochowa, PR3, Poland, 66.23 MHz, 20 kW, Distance 1080 km
Gdansk, PR3, Poland, 66.29 MHz, 40 kW, Distance 1100 km

Antenna: crossed Yagi, 4 elements, Azimuth 270 o (=East), elevation 30 o
Antenna amplifier: 25 dB max level 90 dBmuV
Receiver: commercial, Progresson 447A, TESLA, Bratislava
Sensitivity: 8 muV for S/N = 26 dB (300 Ohm)
Observing method: automated setup, 150 samples/second, 8 bit resolution.
[Time and details of all individual meteor reflections are stored on file
in the University of Ghent format (Prometeos), and are available for
further analysis. Reduction software for DOS and Windows available].

Raw counts of reflections with a duration of at least 0.027 s
during one hour interval starting at UT:

October 1994
Orionids

Oct 1994	20h	21	22	23	00	01	02	03	04	05	06	07
1- 2	28	40	52	31	38	29	11%	1%	30	91	91	72
2- 3	33	55	42	47	32	5%	1%	23	69	71	67	60
3- 4	69	103	116	85	63	13%	1%	63	126	143	131	138
4- 5	74	105	124	136	114	6%	6%	79	162	159	150	142
5- 6	101	101	150	115	94	9%	7%	124	186	183	173	154
6- 7	74	117	144	113	113	7%	6%	156	170	179	171	149
7- 8	77	102	128	118	103	26%	2%	56	179	153	157	165
8- 9	89	127	159	126	90	107	23%	8%	71	188	152	153
9-10	77	86	140	114	90	12%	12%	143	169	175	165	122
10-11	86	120	132	132	93	55%	12%	81	128	140	128	128
11-12	83	104	113	81	70	41%	3%	58	150	139	112	100
12-13	96	145	116	98	105	5%	30%	123	145	124	118	70
13-14	87	93	127	87	77	3%	6%	80	143	134	127	107
14-15	-	-	-	-	-	-	-	-	-	-	-	-
15-16	93	114	145	91	83	94	44%	5%	63	129	147	148

```
16-17 | 93 114 127 106 107 23% 1% 81 158 164 197 121
17-18 | 88 104 166 149 103 29% 9% 126 203 231 188 180
18-19 | 103 162 191 188 156 18% 16% 201 297 285 213 207
19-20 | 103 151 153 161 168 28% 9% 142 284 227 226 204
20-21 | 92 122 196 160 148 25% 18% 129 227 187 176 179
21-22 | - 140 176 143 133 29% 5% 183* 332* 394* 249* 199
22-23 | 108 150 213 170 183 201 84% 24% 162 283* 272* 229
23-24 | & & 160 143 146 23% 7% 156 237 169 204 141
24-25 | 107 153 150 124 135 29% 9% 90 175 153 170 151
25-26 | 97 148 174 166 132 22% 21% 195 158 167 188 150
26-27 | 95 158 166 137 121 18% 7% 168 155 172 174 118
27-28 | 104 132 167 150 128 13% 11% 112 176 170 172 139
28-29 | 95 146 166 144 112 39% 7% 65 162 169 193 154
29-30 | 101 132 174 124 112 128 30% 32% 128 160 150 131
30-31 | 111 149 163 134 126 18% 23% 123 158 186 178 146
31-01 | 136 150 168 161 110 124 91% 151 177 206 202 154
------|-------------------------------------------------------------
1994 | 20h 21 22 23 00 01 02 03 04 05 06 07
Oct |
```

Notes:

. change in hardware setup on Oct 3 (a dedicated PC-AT is now in place).

. % : transmitter outage during the whole hour or a part of it. Low counts indicate that no other interference, which could be confused with meteors, is picked up.
Few transmitters are broadcasting between 2h-4h local time (Sat-Sun 3h-5h local time) or sometimes longer. (When winter hour is in use: local time = UT + 1h).
The switch to winter hour took place during the night of Sept 24-25.

. & : manually eliminated for direct reception.

* strong activity can be noticed on 22 Oct 3h - 6h UT and 23 Oct 5h - 6h UT. The Orionid radiant rises at 20h30m, and sets at 11h15m. Best forward scatter conditions for this setup around 5h - 7h UT.

M. De Meyere / C. Steyaert

2. ABOUT THE RMOB

The RMOB is an independent initiative of some workers in the field of radio meteor scatter observations and data reduction. It started in August 1993 in order to spread rapidly the Perseid results via E-mail. Since then, it has appeared monthly, and has gradually been expanded.

Typically it contains: summaries of recent observations, first results of stream activity by radio methods, relations between radio and optical meteors, references to other publications in the field of meteor astronomy and radio scatter techniques, announcements of meetings, short questions and answers, non-commercial (second hand) sale of radio equipment, available software.

Contributors are mentioned, and interested persons are asked to contact them directly.

RMOB can be copied freely in unabridged and unmodified form. Extracts should indicate the source (Radio Meteor Obs Bulletin, month and year).

If you want to subscribe (or unsubscribe) to the E-mail distribution list, please send a message to C. Steyaert.
Those not having access to E-mail can obtain a printed copy free of charge from J. Van Wassenhove (current or back-issues).

3. CONTRIBUTORS / USEFUL ADDRESSES

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tel: +32 (9) 282 35 26
Call: ON4NU, packet: ON4NU@ON4AWP
E-mail: via Chris Steyaert

Chris Steyaert, VVS
Kruisven 66, B 2400 Mol, Belgium
tel: +32 (14) 31 51 04
fax: +32 (14) 22 13 73
E-mail: steyaert@vvs.innet.be

Jeroen Van Wassenhove, VVS
's Gravenstraat 66, B 9810 Nazareth, Belgium
tel: +32 (9)385 61 09
E-mail: 100101.734@compuserve.com

Paul Vauterin, University of Ghent, Astronomical Observatory
E-mail: paul@izar.rug.ac.be
--
Christian Steyaert (RMOB9410) 7 November 1994
--

1832. Balloon pressure transducers

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 23:14:34 UTC
From: "Theresa T." <mhaskins@facstaff.wisc.edu>
Message-ID: <39mccq$cru@news.doit.wisc.edu>
Source record: 26434

Last week someone posted a message, since scrolled off my system, asking about pressure transducers for a high school balloon project. I've just found a great source for a cheap, high quality transducer.

The Transducer:Microswitch 142PC15A

It's a plastic box the size of two dominos with two nipples (one blocked off) and three pins. The pins are +, GND and OUT.

The output is a voltage that increases linearly from 1 to 5 volts as the pressure varies from 0 to 15 pounds. It's temperature compensated.

A friend, WB9YHB, found these in an old catalog for $84.00 each. However, a surplus place in Dayton sells them for $2.95! And if you order ten or more, that drops to $2.50!

The company is:

MECI (Mendelson Electronics Co. Inc)

Their phone is 1-800-344-4465 Voice 9a-6p EST Mon-Fri
1-800-344-6324 Fax 24 hours

The MECI part number is 540-6206F and it's on page 9 of their catalog.

Unfortunately, they have a $20.00 minimum order, so get ten of them!

73, Dave, N9LTD

1833. Where can I order a satellite photo of a city in Siberia?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-07 23:30:57 UTC
From: craig@nanny.rosemount.com
Message-ID: <1994Nov7.233057.25862@rosevax.rosemount.com>
Source record: 26435
Cross-posted to: rec.video.satellite,rec.radio.amateur.space,rec.photo,sci.image.processing

I want to know where I can order a satellite photo of
a city in Siberia (Krasnoyarsk).

Sorry for the cross posting, I picked groups where readers
might have the knowledge.

Years ago I ordered a photo of US city through the mail.
I can't remember who I ordered it through, and I believe
the organization changed its mission later anyway.

Any help appreciated.
Email is fine for replies.

--
Craig F. Taylor
craig@rosemount.com
Minneapolis Minnesota
Work (612) 895-2254

1834. How to get alias on amsat.org?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 10:08:07 UTC
From: serge@systech.mhs.oz.au
Message-ID: <1994Nov8.100807.107@systech.mhs.oz.au>
Source record: 26437

The title says it all. How do I get an alias on amsat.org?

Thanks in advance.

Serge

VK4BSB

1835. Re: Omnidirectional Ant's

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 13:18:19 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.45.000D4E97@teleport.com>
Source record: 26441

In article <39d7qv$2hb@grissom.powerup.com.au> plove@powerup.com.au (Paul Love) writes:
>From: plove@powerup.com.au (Paul Love)
>Subject: Omnidirectional Ant's
>Date: 4 Nov 1994 12:01:35 GMT

>Greetings All, I've always wanted to get involved in Amateur satelites ,
>but the cost has always deterred me. However i've seen designs in ARRL
>H/book for "turnstile" antenna's. This would allow me to "get my feet wet"
>, but here's the question : Is there anyone out there ACTUALLY using such
>antenna's ?

I used one for many years, while I was in an apartment, and I had very good
results. Pay close attention to the spacing between the elements and the
ground. This has a big effect on the pattern. For a non-rotated antenna, I
think 3/8 wave spacing was good.

To be able to transmit, be careful with the
phasing line used. A simple 1/4 wave on one dipole is fine for receiving, but
gives a higher SWR on TX. I can send you a drawing of a good feed setup, or
you can try trimming the elements to get it down.

I mentioned this antenna once before here, and it was clear to me that many
did not understand it, so be careful of misinformation!

See-Ya-Bye!
Bill, n7ryw@teleport.com

1836. Re: Where can I order a satellite photo of a city in Siberia?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 13:47:37 UTC
From: rao@ctd.comsat.com
Message-ID: <39nvhp$66j@neal.ctd.comsat.com>
Source record: 26438
Cross-posted to: rec.video.satellite,rec.radio.amateur.space,rec.photo,sci.image.processing

You can try SPOT Image at 703-620-2200 (10 meter resolution). A cheaper source may be Russian imagery. I know that TRW is selling those. A contact in TRW in California is Liz Greenberg - product manager. I dont have her ph number

--
Ashok Rao
COMSAT Labs
22300 Comsat Drive
Clarksburg, MD 20871
Ph. 301-428-4079
Fax 301-428-9287
email rao@ctd.comsat.com

Craig Taylor (craig@nanny.rosemount.com) wrote:
: I want to know where I can order a satellite photo of
: a city in Siberia (Krasnoyarsk).

: Sorry for the cross posting, I picked groups where readers
: might have the knowledge.

: Years ago I ordered a photo of US city through the mail.
: I can't remember who I ordered it through, and I believe
: the organization changed its mission later anyway.

: Any help appreciated.
: Email is fine for replies.

: --
: Craig F. Taylor
: craig@rosemount.com
: Minneapolis Minnesota
: Work (612) 895-2254

1837. Re: Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 15:19:54 UTC
From: zlau@arrl.org
Message-ID: <1994Nov8.151954.2585@arrl.org>
Source record: 26468

Jonathan Ho (jho@xilinx.COM) wrote:
: Hi there,

: I'd like to share some of the thought with you guys on the net about the
: futhre ham satellites. I always hear from satellite hams say that LEO sat
: is easy to work and is good for a short contact. OSCAR-13 is good for DX and
: long QSO and
: however, it is not easy to work (expensive equipment and tracking etc) and
: signal is always weak.

: Since there are a lot of commerical geostationary
: satellites on the orbits, is it possible that we hams can build reasonable
: ERP small size transponders placing in the commericial satellites to share
: some common facilities such as solar panels on the commercial sat platforms?
: If this can be done, several ham sats can be linked so that a reliable world wide
: ham sat network can be formed.

The signal are weak because of distance. A LEO at 500 miles is 32 dB
stronger because of the inverse square law. You can compensate for this
with spot beams, if you don't mind sacrificing coverage. But, if you
have to cover the entire earth, you are limited to roughly 20 dBi gain.
Thus, you need lots of watts (many solar panels) to get the ERP up so that
people on the ground can use small VHF antennas for receive.

Or, you could use a little dish with a preamp at the feed for 2.4 GHz.
The sky noise is much quieter at microwaves.

(BTW, 32 dB is the difference between a legal limit station in the USA and
a 1 watt QRP station--people spend lots of $$ to achieve this--many radios
would be cheaper if everyone were satisfied with 1 watt)

But, this doesn't quite solve the uplink problem--how people will
access the satellite with small antennas and low power. The
satellite receiver is hampered by the warm Earth (ground stations
get to look at cold sky), so the trick of going to a quiet
microwave band doesn't quite work.
--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

1838. STS-66 Element Set (94312.607)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 15:30:45 UTC
From: elements-request@alsys.com
Message-ID: <STS-66.94312.607@alsys.com>
Source record: 26466
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-66
1 23340U 94073A 94312.60790007 .00237193 10343-4 75414-3 0 66
2 23340 56.9901 175.2045 0015178 296.4108 63.5408 15.91549666 794

Satellite: STS-66
Catalog number: 23340
Epoch time: 94312.60790007 = (08 NOV 94 14:35:22.56 UTC)
Element set: 006
Inclination: 56.9901 deg
RA of node: 175.2045 deg Space Shuttle Flight STS-66
Eccentricity: .0015178 Keplerian element set JSC-006
Arg of perigee: 296.4108 deg from NASA flight Day 6 vector
Mean anomaly: 63.5408 deg
Mean motion: 15.91549666 rev/day Gil Carman
Decay rate: 2.37193e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 79

This data is also available via the Shuttle Elements Mailing
List. For more information about the list and how to subscribe,
send a message to with only the command "info elements" in the
body of your message to "listserv@alsys.com".

--
--
Gary Morris Internet: garym@alsys.com
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1839. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 17:38:17 UTC
From: zeus@myth.demon.co.uk
Message-ID: <784316297snz@myth.demon.co.uk>
Source record: 26439

In article <vLfkkClgnovE055yn@helix.net>
gkennedy@helix.net "Geoff L. Kennedy" writes:

> If it turns out that I have to join, what does membership "get" me
> (besides the stuff I'm after in the first place).....I'm not a Ham radio
> operator, so I don't have any real interest in those satellites. It
> also seems that it's a bit pricey.....somewhere I heard $80 US (or was

I don't know about Amsat US, but Amsat-UKs subscription is about 15 gbp
a year. This gets you 6 copies of Oscar News. What is left (very little) goes
to the new satellite fund. Despite being a licensed amateur, I have never
transmitted through the birds but feel that nevertheless it is only right
that I contribute to the facilities I use.

Mike.

--

Michael S. Cowgill (Mike) _ " ....Cracking toast Gromit!... "
zeus@myth.demon.co.uk (That's me) _ Royal Blue Dragon
G1VOX@GB7WRG.GBR.EU 44.131.2.76 _ -==(UDIC)==-

1840. DSP-93

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 18:06:23 UTC
From: ROBERTSM@JSC.MIL
Message-ID: <sebf7811.023@JSC.MIL>
Source record: 26440

Has anyone on the net used the AMSAT/TAPR DSP-93 system for satellite
and terrestrial work? I would be interested in your opinion of the
DSP-93.
73 Mel W3MR robertsm@jsc.mil

1841. Re: Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 22:16:49 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov8.221649.13602@ke4zv.atl.ga.us>
Source record: 26442

In article <1994Nov8.151954.2585@arrl.org> zlau@arrl.org (Zack Lau (KH6CP)) writes:
>But, this doesn't quite solve the uplink problem--how people will
>access the satellite with small antennas and low power. The
>satellite receiver is hampered by the warm Earth (ground stations
>get to look at cold sky), so the trick of going to a quiet
>microwave band doesn't quite work.

To give a feel for that, we use 3 meter dishes and 400 watt TWT
amps at Ku Band to just get a sparklie free video picture on a
GE K2 transponder (the most senstive in our footprint). That's
a hell of an ERP for most amateurs to think about generating.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1842. November 12th balloon flight

Newsgroup: rec.radio.amateur.space
Date: 1994-11-08 23:00:28 UTC
From: djs19@ksu.ksu.edu
Message-ID: <39ovuc$h8q@matt.ksu.ksu.edu>
Source record: 26450

The SSOK (Sky Science Over Kansas) group is planning a high altitude balloon launch the weekend of November 12th with a backup date of November 13th.

This is a continuing series of helium balloon flights carrying a GPS receiver with the goal of reaching over 125,000 feet. With the use of GPS data an altitude can be verified within several hundred feet and used as a benchmark for future flights by amateur balloonists.

With an altitude of 125k feet, radio range should be near 500 miles for stations using beam antennas. We encourage all stations to send reports either by the 40 meter net or by the return address given below. Indicate when you FIRST hear the signal. Please give UTC time and your location in latitude and longitude or by grid square to 6 places. Please note the type of receiving system you are using at this time, i.e. narrow band (cw/ssb) or FM. Also send in the first complete packet line received, this will have the UTC time with it. With this information we will compare the calculated difference between the optical and radio range and study the signal propagation at different receiving points.

Flight information:

Launch date: November 12, 1994 Backup on the 13th
Time: 1500 UTC, (9am cst)
Place: Salina, Ks 97,46,43W 38,49,33N

Package information:

Downlink frequency: 144.340 Will transmit every 10 seconds
Mode: Packet GPS data, (GGA line)
Beacon#1: 147.310 <5mw
Beacon#2: 28.322 5mw

Net control:

Low band 40 meters: 7.155 Will have latest status starting at 1400 UTC
Call WB0DRL
Send reports to:

WB0DRL, callbook address
e-mail to <djs19@ksu.ksu.edu>

```
Sample GGA line: (partial)
altitude
$GPGGA,142728.00,3831.250,N,09748.901,W,1,06,1.3,10541.2,M
[.time..] [.lat....] [.long....] [in mtrs]
```

1843. Re: Keplerian data for NOAA birds

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 00:11:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.284.2922@freddy.supernet.ab.ca>
Source record: 26443

Hi Bill,
If you need new keps for tracking, they can be had for free and here is how....send an email to the Dallas Radio Imaging Group with nothing in the body, in other words just the address (weathkep@drig.com) and you will automaticly receive via email, keps on all weather sats.

additional info= elements@drig.com gets you all elements you want
amsatkep@drig.com gets you amsat format elements
(amateur sats only)
shuttle@drig.com gets you shuttle elements when avlb.
weathkep@drig.com gets weather sat elements
info@drig.com gets infomation on how to etc.

Well, hope this helps you and good luck with the birds.

73 de VE6LU ERNIE KOCH
(ernie.koch@freddy.supernet.ab.ca)

1844. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 00:11:38 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.784339898@eel>
Source record: 26444
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.info

From: tkelso@afit.af.mil (TS Kelso)
Subject: Two-Line Orbital Element Set: Space Shuttle
Date: 9 Nov 94 00:11:38 GMT
Organization: Air Force Institute of Technology
Message-Id: <tkelso.784339898@eel>

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 66
1 23340U 94073A 94312.25000000 -.00000910 10343-4 70863-5 0 223
2 23340 56.9908 176.8638 0015656 294.8724 174.1298 15.91476332 721
1994073B
1 23341U 94073B 94311.91705109 .00250327 33662-4 77139-3 0 79
2 23341 56.9917 178.4041 0010888 284.8994 75.0810 15.91343261 675
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1845. Proper way to call Mir / Shuttle help needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 01:15:04 UTC
From: tomsunman@aol.com
Message-ID: <39p7qo$gip@newsbf01.news.aol.com>
Source record: 26445

Hello. I'm a new ham and I'm VERY interested in trying to contact
Mir and the shuttle (when sarex is used of coarse!).
My question is, what is the PROPER procedure for calling these craft? Is
it a regular call (their callsign then "this is" my callsign)? Maybe
"shuttle atlantis" (or whichever) "this is my callsign"? I want to make
sure I do it properly.
I have an HT and I understand they can work but I may need higher
power and a better antenna to increase my chances. I know the uplink is
145.550, I suppose I need to switch to the downlink after I make my call
to hear their responce. What is the downlink frequency? Any help on
getting me started on these contacts would be appreciated. My license
should be here in about 5 weeks so I've got some time to learn what I need
to know. Thanks!

73's

Tom Randall

1846. Re: Proper way to call Mir / Shuttle help needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 03:31:15 UTC
From: giles.26@postbox.acs.ohio-state.edu
Message-ID: <giles.26.6.2EC04283@postbox.acs.ohio-state.edu>
Source record: 26446

In article <39p7qo$gip@newsbf01.news.aol.com> tomsunman@aol.com (TOM SUNMAN) writes:
>From: tomsunman@aol.com (TOM SUNMAN)
>Subject: Proper way to call Mir / Shuttle help needed
>Date: 8 Nov 1994 20:15:04 -0500

> Hello. I'm a new ham and I'm VERY interested in trying to contact
>Mir and the shuttle (when sarex is used of coarse!).
>My question is, what is the PROPER procedure for calling these craft? Is
>it a regular call (their callsign then "this is" my callsign)? Maybe
>"shuttle atlantis" (or whichever) "this is my callsign"? I want to make
>sure I do it properly.
> I have an HT and I understand they can work but I may need higher
>power and a better antenna to increase my chances. I know the uplink is
>145.550, I suppose I need to switch to the downlink after I make my call
>to hear their responce. What is the downlink frequency? Any help on
>getting me started on these contacts would be appreciated. My license
>should be here in about 5 weeks so I've got some time to learn what I need
>to know. Thanks!

>73's

>Tom Randall

For the shuttle, the DOWNLINK is 145.550. The UPLINKS for voice are 144.91,
144.93, 144.95, 144.97, 144.99. The uplinks are random so just pick one.

Mir transmits simplex on 145.550.

1847. Re: Where to get MacSat?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 10:09:04 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <94110910090400027@g0oanint.demon.co.uk>
Source record: 26448

In article <tkreyche-071194113023@tomkreyche.zdlabs.ziff.com>, Tom Kreyche writes:

>
> I've looked all over the net and called Celestial BBS and can't find
> MacSat. Does anyone know where to get it? Also, the apple ftp site for ham
> radio is completely empty! What's the deal?
>
> Thanks, Tom KG6YJ

Hello Tom,

Try,

ftp.demon.co.uk /pub/ham/mac

you find about 10 meg compressed Mac ham programmes in there including SatTrack, Orbitrack and MacSPOC.

Any problems or if you need any more info please let me know.

Regards,

Sean.

1848. satellite situation reports, where can I get them?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 15:02:00 UTC
From: mora@bb.fido.de
Message-ID: <b24510e0%fidonet@p41.f106.n6000.z242.fidonet.org>
Source record: 26449

Hello!

I'm searching the 'Satellite Situation Report' from NASA as an ASCII-file.

Sombody explained me how to connect the RAID.BBS via a telnet session
at raidbbs.gsfc.nasa.gov, where this files should be stored for download.
When I logged in, a message appeared, that the BBS has moved to
olg1.gsfc.nasa.gov.

But the old password doesn't work. And Anon-FTP seems to be not allowed
on this site.

Does anybody know, here I can ftp the satsit*.rpt-files or how I can
log-in as 'guest' at OLG1?

Any hints would be great!

Bye Internet : mora@bb.fido.de
- Juergen - Fido(C&L) : 2:2449/422.41

1849. Re: Q: MIR, current callsign?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 17:02:43 UTC
From: 15sms24.hqamc@mhs.safb.af.mil
Message-ID: <39qvbj$mqo@xor.com>
Source record: 26451

In message <tkreyche-071194113023@tomkreyche.zdlabs.ziff.com>,
tkreyche@zdlabs.ziff.com (Tom Kreyche) writes:

>I've looked all over the net and called Celestial BBS and can't find
>MacSat. Does anyone know where to get it? Also, the apple ftp site for ham
>radio is completely empty! What's the deal?
>
>Thanks, Tom KG6YJ

This is what I found for MacSat Tom: It's apparently available on at least two
servers on the internet.

archie.au 139.130.23.2 in the /pub/ciac/macutils directory
filename: macsat.sit
and
ra.nrl.navy.mil 128.60.0.21 in the /MacSciTech/astro directory
filename: macsat-11.hqx

Hope this gets you on your way.

Greg Horine | "Of course these opinions are
NAR 62194 | mine, they're the only thing that
Amateur Radio N9PBD | I do own!"
15sms24.hqamc@mhs.safb.af.mil

1850. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 17:52:02 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.784403522@dolphin>
Source record: 26452
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.info

From: tkelso@afit.af.mil (TS Kelso)
Subject: Two-Line Orbital Element Set: Space Shuttle
Date: 9 Nov 94 17:52:02 GMT
Organization: Air Force Institute of Technology
Message-Id: <tkelso.784403522@dolphin>

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 66
1 23340U 94073A 94313.25000000 -.00000898 10350-4 70651-5 0 266
2 23340 56.9914 172.2385 0012492 294.0255 146.9296 15.91735728 882
1994073B
1 23341U 94073B 94311.91705109 .00250327 33662-4 77139-3 0 79
2 23341 56.9917 178.4041 0010888 284.8994 75.0810 15.91343261 675
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1851. Re: Ham Satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 18:26:15 UTC
From: jho@xilinx.COM
Message-ID: <199411091826.AA01416@clemenza.xilinx.com>
Source record: 26453

Jonathan Ho (jho@xilinx.COM) wrote:
: Hi there,

: I'd like to share some of the thought with you guys on the net about the
: futhre ham satellites. I always hear from satellite hams say that LEO sat
: is easy to work and is good for a short contact. OSCAR-13 is good for DX and
: long QSO and
: however, it is not easy to work (expensive equipment and tracking etc) and
: signal is always weak.

: Since there are a lot of commerical geostationary
: satellites on the orbits, is it possible that we hams can build reasonable
: ERP small size transponders placing in the commericial satellites to share
: some common facilities such as solar panels on the commercial sat platforms?
: If this can be done, several ham sats can be linked so that a reliable world wide
: ham sat network can be formed.

Zick Lau wrote:

>The signal are weak because of distance. A LEO at 500 miles is 32 dB
>stronger because of the inverse square law. You can compensate for this
>with spot beams, if you don't mind sacrificing coverage. But, if you
>have to cover the entire earth, you are limited to roughly 20 dBi gain.
>Thus, you need lots of watts (many solar panels) to get the ERP up so that
>people on the ground can use small VHF antennas for receive.

>Or, you could use a little dish with a preamp at the feed for 2.4 GHz.
>The sky noise is much quieter at microwaves.

Hi Zick,

Probably you have the "first hand" information about feasibility to use
comsat, metrosat, DOD sat platforms to peggyback hamsats. I bring this up
simply because, I think, this is easier to achieve than build an brand new
phane 3D for satellite Dxing. What do you think?

Jonathan/ab6ls

1852. S-band receivers, TNCs, KCT

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 19:01:00 UTC
From: rargyle@cc.weber.edu
Message-ID: <9NOV199412011519@cc.weber.edu>
Source record: 26457

For a LEO satellite now in the design stage, we will have a 307.2 kbaud digital downlink in a 100 kHz (or less?) channel. Could someone point me to sources of an S-band radio capable of being computer tuned over the > 100 Khz doppler shift, with adequate bandwidth?

Is it possible to modify the PacComm Tiny-2 (or other TNC) for this baudrate?

We will have two downlinks, S-band and UHF. What modification to the Kansas City Tracker/Tuner hardware and software will be needed to simultaneously control radios in two bands?

One possibility is to downconvert the S-band to (say) VHF, and use a separate KCT/T and computer; has anyone experience using KCT/T, or a Trackbox, etc., with downconverted tuning?

Please reply by e-mail
73, and thank you,
Bob Argyle rargyle@cc.weber.edu kb7kcl on AO-16,LO-19

1853. Re: Where can I order a satellite photo of a city in Siberia?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-09 21:42:59 UTC
From: jean_kim@smtp.svl.trw.com
Message-ID: <jean_kim-091194134259@spuds.svl.trw.com>
Source record: 26454
Cross-posted to: rec.video.satellite,rec.radio.amateur.space,rec.photo,sci.image.processing

In article <39nvhp$66j@neal.ctd.comsat.com>, rao@ctd.comsat.com (Ashok Rao)
wrote:
> You can try SPOT Image at 703-620-2200 (10 meter resolution).
> A cheaper source may be Russian imagery. I know that TRW is selling those.
> A contact in TRW in California is Liz Greenberg - product manager.
> I dont have her ph number

Her phone number is (408) 738-2888 x4252

>
> Craig Taylor (craig@nanny.rosemount.com) wrote:
> : I want to know where I can order a satellite photo of
> : a city in Siberia (Krasnoyarsk).
>
> : Sorry for the cross posting, I picked groups where readers
> : might have the knowledge.
>
> : Years ago I ordered a photo of US city through the mail.
> : I can't remember who I ordered it through, and I believe
> : the organization changed its mission later anyway.
>
> : Any help appreciated.
> : Email is fine for replies.
>
> : --
> : Craig F. Taylor
> : craig@rosemount.com
> : Minneapolis Minnesota
> : Work (612) 895-2254

+===+
jean_kim@smtp.svl.trw.com
970 Stewart Dr., Sunnyvale, CA
#include <std/disclaimer.h>
"There are only three forces in the universe.
Energy, Matter, and Enlightened Self Interest.
And the sooner you realize that, the better off you'll be."
-G'Kar, Babylon 5
+===+

1854. Re: DSP-93

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 02:11:02 UTC
From: rparsons@bga.com
Message-ID: <rparsons-0911942011020001@slip161.bga.com>
Source record: 26455

In article <sebf7811.023@JSC.MIL>, ROBERTSM@JSC.MIL wrote:

> Has anyone on the net used the AMSAT/TAPR DSP-93 system for satellite
> and terrestrial work? I would be interested in your opinion of the
> DSP-93.
> 73 Mel W3MR robertsm@jsc.mil

I have been beta testing the DSP-93 for several months. I have used it on 9600 bps satellites and 1200 bps terrestrial packet. Others in the group have used it with the PSK birds and HF "packet".

Performance is equal or better than the DSP-2232 in my case. I use it with an IC-970.

Ron W5RKN
w5rkn@amsat.org

1855. Re: Proper way to call Mir / Shuttle help needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 03:50:05 UTC
From: wdunckel1@aol.com
Message-ID: <39s59d$6ov@newsbf01.news.aol.com>
Source record: 26456

In article <39p7qo$gip@newsbf01.news.aol.com>, tomsunman@aol.com (TOM SUNMAN) writes:

>My question is, what is the PROPER procedure for calling these craft? Is >it a regular call (their callsign then "this is" my callsign)? Maybe >"shuttle atlantis" (or whichever) "this is my callsign"? I want to make >sure I do it properly.

For Shuttle, just say the phonetics of your callsign. For istance, Kilo Delta Victor Yanke Victor for me KD6VYV. If they hear you they will repeat your callsign and give you a reference number. They change channels between the four randomly. So you wont know what channel they are listening to even though you hear them on 145.550! They do this to get rid of the huge pileups they would get if everyone was trying to transmit on the same freq. Good luck,
Walt

1856. graphical satellite tracker for linux?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 12:52:25 UTC
From: uld8@rzstud1.rz.uni-karlsruhe.de
Message-ID: <39t529$dmp@nz12.rz.uni-karlsruhe.de>
Source record: 26458

hy everyone..

i'm looking for a satellite tracking program for LinuX, that can produce
realtime graphical output with X11 or svgalib.
i've got one that produces listings, so that is NOT what i'm searching.

vy 73s de Gunnar, uld8@rz.uni-karlsruhe.de
AX.25: dg1ie@db0sao.deu.eu

1857. Re: Nov. 12th balloon launch

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 18:07:27 UTC
From: miles@mail.utexas.edu
Message-ID: <miles-1011941207320001@klingon.util.utexas.edu>
Source record: 26459

In article <39p9hk$11n@matt.ksu.ksu.edu>, djs19@ksu.ksu.edu (Don J Sias) wrote:

> The SSOK (Sky Science Over Kansas) group is planning a
> high altitude balloon launch the weekend of November 12th
> with a backup date of November 13th.

Thank you for posting this! I hope other groups doing balloon work will
also post to rec.radio.amateur.space...as far in advance as possible, so
it can go into local club newsletters.

= =
_ Miles Abernathy, N5KOB = I have a spelling checker.
| |__ miles@mail.utexas.edu = It came with my PC.
_| | POB 7580, Austin TX 78713 = It plane lee Marx four my review
\ * / University of Texas @ Austin = Miss steaks aye can knot sea.
\/ tel. (512) 471-6521 U.S.A. = (from mini-JIR)
= =

1858. Re: Wanted: Info on geeking at sea via satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 20:45:38 UTC
From: aranders@kosepc01.delcoelect.com
Message-ID: <39u0pi$pdj@kocrsv08.delcoelect.com>
Source record: 26460

zeus@myth.demon.co.uk (Mike Cowgill) writes:
>Two way data via Inmarsat is *very* expensive. We are talking around $/KB
>[...]There is a company that do broadcast UseNet (at 1200bps compressed)
>via satellite but I can't remember their name :-(. They do have a couple of
>newsgroups though if you fancy a trawl through the big list.

You're probably referring to Pagesat. Try the biz.pagesat newsgroup.

--
Alan Anderson .-- -... ----. .-. ..- ..-. | Ignorance can be fixed,
(I speak AT, not FOR, Delco Electronics) | but stupidity is permanent.

1859. STS-66 Element Set (94314.805)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 21:15:33 UTC
From: elements-request@alsys.com
Message-ID: <STS-66.94314.805@alsys.com>
Source record: 26469
Cross-posted to: sci.space.news,rec.radio.info,rec.radio.amateur.space

```
STS-66
1 23340U 94073A 94314.80545708 .00267769 16725-4 84539-3 0 77
2 23340 56.9949 165.0315 0010404 290.5741 69.4212 15.92652338 1148

Satellite: STS-66
Catalog number: 23340
Epoch time: 94314.80545708 = (10 NOV 94 19:19:51.49 UTC)
Element set: 007
Inclination: 56.9949 deg
RA of node: 165.0315 deg Space Shuttle Flight STS-66
Eccentricity: .0010404 Keplerian element set JSC-007
Arg of perigee: 290.5741 deg from NASA flight Day 8 vector
Mean anomaly: 69.4212 deg
Mean motion: 15.92652338 rev/day Gil Carman
Decay rate: 2.67769e-03 rev/day^2 NASA Johnson Space Center
Epoch rev: 114

This data is also available via the Shuttle Elements Mailing
List. For more information about the list and how to subscribe,
send a message to with only the command "info elements" in the
body of your message to "listserv@alsys.com".

--
--
Gary Morris Internet: garym@alsys.com
Alsys Inc. Packet: KK6YB @ N0ARY.#NOCAL.CA.USA.NA
San Diego, CA, USA Phone: +1 619-457-2700 x128 (voice/fax)
```

1860. HF-UHF Transverter info

Newsgroup: rec.radio.amateur.space
Date: 1994-11-10 23:34:33 UTC
From: beau@enterprise.america.com
Message-ID: <39uam9$5l7@enterprise.america.com>
Source record: 26461

I have a Kenwood TS-430S HF tranceiver. I would like information on
the X-verter output of this radio. I plan on hooking it up to a
Down East Microwave DEM432-15S Transverter. I am looking for the
output power of the Kenwood thru the x-verter port and the compatability
between the transverter and the Kenwood.

specs on the transverter:

input 1mw max @28Mhz

The transverter currently covers two segments of the 70cm band,
432-434 and 435-437Mhz. I would like to modify the the transverter
to cover 444-446Mhz instead of the 435-437Mhz sector. Any info on
this conversion would be appreciated.

I would also like any comments on the operation of this transverter by
anyone who has operated one.

```
_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/ _/
_/ _/
_/ Internet = beau@enterprise.america.com _/
_/ VHF Packet = kd4gfy@kb4t.#dabfl.fl.usa.na _/
_/ _/
_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/_/
```

1861. Ku Band Satellite Receivers ?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 00:30:16 UTC
From: harold@cc.gatech.edu
Message-ID: <39uduo$cu5@forge.cc.gatech.edu>
Source record: 26462

Anyone have a list of commercially available Ku band satellite
recievers?

thanks.
harold

--
FORBES, HAROLD C. N5JCM harold@cc.gatech.edu
Georgia Institute of Technology, Atlanta Georgia, 30332
http://www.cc.gatech.edu/grads/f/Harold.Forbes/Harold.Forbes.html
uucp: ...!{allegra,amd,hplabs,seismo,ut-ngp}!gatech!cc!harold

1862. Two-Line Orbital Element Set: Space Shuttle

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 03:00:39 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.784522839@eel>
Source record: 26463
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space,rec.radio.info

From: tkelso@afit.af.mil (TS Kelso)
Subject: Two-Line Orbital Element Set: Space Shuttle
Date: 11 Nov 94 03:00:39 GMT
Organization: Air Force Institute of Technology
Message-Id: <tkelso.784522839@eel>

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, *(205) 409-9280*, and are updated daily (when possible). Documentation and tracking software are also available on this system. As a service to the satellite user community, the most current elements for the current shuttle mission are provided below. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily), shuttle elements, and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

STS 66
1 23340U 94073A 94314.25000000 -.00000862 10361-4 70227-5 0 292
2 23340 56.9932 167.6094 0011790 295.9840 118.4699 15.92179167 1047
1994073B
1 23341U 94073B 94311.91705109 .00250327 33662-4 77139-3 0 79
2 23341 56.9917 178.4041 0010888 284.8994 75.0810 15.91343261 675
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

1863. Re: Wanted: Info on geeking at sea via satellite

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 03:52:30 UTC
From: bbs@kd3bj.ampr.org
Message-ID: <Cz343J.n4y@kd3bj.ampr.org>
Source record: 26464

Bill: Getting into Usenet from the boat can be done with a portable satellite telephone terminal. That's expensive. Also, the portable terminal
may not be equipped to track as the boat rolls. I remember a Prodigy classroom thing from last year where some fellows were sailing from San Francisco to Boston around Cape Horn and stayed in touch on a daily basis. I believe, though that they received faxes, and sent replies via radio for forwarding into the Prodigy system. With the quality of ship-to-shore HF, you don't want to try using it for data. Even the ham AMTOR system isn't particularly efficient on HF at 300 baud and slower. It would take you awhile to read your usenet news. HF ship-to-shore might be useful for E-mail. See if someone else can provide better input about this.
Bob Garland

--
Robert Garland

1864. Avhrr Raw Data!!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 04:38:27 UTC
From: spek@cats.ucsc.edu
Message-ID: <39usg3$3qv@darkstar.UCSC.EDU>
Source record: 26465

Does anybody have any information on avhrr raw data, (ftp sites, http sites)
Any information will do. I need to get some to work on . I am trying to
design an image processing program for the data.

I could also use some data on avhrr image formats and related information.

Please send me mail at my acct as I do not always check the newsgroups

thanks
jas

1865. AO-27's Back!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 12:54:00 UTC
From: clinton.peebles@salmon.islandnet.com
Message-ID: <94111203082193@salmon.islandnet.com>
Source record: 26493

```
G>Well, it seems that AO-27 is back in the analog FM Repeater mode. I worked
G>VE7VVW Ron (*) on Saturday afternoon; he had a really nice signal, subject
G>to the characteristic AO-27 fade. "The Fade" is possibly my problem
G>in not having a circular antenna, but the effect is that a signal will be Q9
G>one minute, and inaudible the next.
```

Can you tell me the uplink/downlink frequencies? I had them written
down somewere, but can't find them...

 QMPro 1.52 The universe is laughing behind your back.

1866. Re: graphical satellite tracker for linux?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 15:35:18 UTC
From: kkudielk@cacofonix.nt.tuwien.ac.at
Message-ID: <3a02vm$f7f@news.tuwien.ac.at>
Source record: 26470

I use SatTrack 2.0 - it does NOT have graphics. But the README says
"SatTrack 3.0 WILL have X11 graphics". Let's wait!

vy 73 de Klaus OE1KIB @ OE1XIB.AUT.EU

--
Dipl.-Ing. Klaus Kudielka
Institut fuer Nachrichtentechnik und Hochfrequenztechnik
Technische Universitaet Wien
Gusshausstr. 25/389
A-1040 Wien, AUSTRIA
Phone: (+43 1) 58801-3556
Fax: (+43 1) 5870583
E-mail: kkudielk@email.tuwien.ac.at

1867. Nov 12 balloon launch

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 19:32:24 UTC
From: rdavis@nyx10.cs.du.edu
Message-ID: <3a0gs8$7do@nyx10.cs.du.edu>
Source record: 26474

The weather seems to be cooperating.
The high altitude balloon launch for Saturday, Nov 12 from Central Kansas
looks like it will happen.
I will be running the HF net from the launch site on 7.155 mhz.
WB0DRL will chase the balloon (it is his balloon) in a light airplane.The
scheduled launch time is 9AM CST, 1500Z
GPS packet data will come from the balloon on 144.340
See you on 7.155

--
rdavis@nyx10.cs.du.edu Robert Davis Salina, KS
Amateur Radio K0FPC

1868. MIR uplink freq.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-11 23:36:07 UTC
From: rgolub@usa.net
Message-ID: <rgolub.12.00179AD3@usa.net>
Source record: 26467

Does anyone know what the uplink frequency and requirements are for the MIR?

Thanking all in advance

Roger, KB0PLS

1869. Where to find Julian Date Table on Internet

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 00:48:30 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <25993.9411120038@life.ecs.soton.ac.uk>
Source record: 26471

Hi there,

The title says it all.

I am interested in the subject of satellite tracking.

Are there any Internet sites/resources which give a definitive Julian
Date Table?

Please reply to my mail box.

Thank you.

Liang S. Ng
Southampton Univ.
U.K.

1870. Meaning of NASA Keplerian Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 01:09:23 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <26087.9411120059@life.ecs.soton.ac.uk>
Source record: 26472

Hi there,

I am a beginner in satellites.

I seek further information and comments about the NASA compatible
Keplerian Element Set, otherwise known as the two-line Keps. By this I
mean the Keps set compatible with the Keps set ftp'able from NASA at
spacelink.msfc.nasa.gov:/Instructional.Materials/Satellite.Tracking.

Are there text books/published articles cover all the Keps described in
the NASA Keps Set? (Please see example. Do anyone know G.L.Carman's
email address (signature in the example) ?)

What are n.mi. (in terms of kilometers), apsidal rotaion, nodal
regression, nodal period, epoch rev.?

Are there any resources about this subject on the Internet?

Thank you.

Yours,
Liang S. Ng
Southampton Univ.
U.K.

Mir element set #749 (7-Sep-94)

Mir
1 16609U 86017A 94250.56352251 .00003305 00000-0 51709-4 0 7493
2 16609 51.6475 134.2346 0001949 22.9470 337.1604 15.56960032488856

Satellite: Mir
Catalog number: 16609
Epoch time: 94250.56352251
Element set: 749
Inclination: 51.6475 deg
RA of node: 134.2346 deg Semi-major axis: 3657.9664 n.mi.
Eccentricity: 0.0001949 Apogee altitude: 214.7452 n.mi.
Arg of perigee: 22.9470 deg Perigee altitude: 213.3193 n.mi.
Mean anomaly: 337.1604 deg Altitude decay: 0.0037 n.mi./day
Mean motion: 15.56960032 rev/day Apsidal rotation: 3.7267 deg/day
Decay rate: 3.3050E-05 rev/day^2 Nodal regression: -4.9994 deg/day
Epoch rev: 48885 Nodal period: 92.4265 min
Checksum: 302

G.L.CARMAN

- - - -

1871. Re: Where can I order a satellite photo of a city in Siberia?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 03:53:09 UTC
From: bbs@kd3bj.ampr.org
Message-ID: <Cz4ysM.3LI@kd3bj.ampr.org>
Source record: 26482
Cross-posted to: rec.video.satellite,rec.radio.amateur.space,rec.photo,sci.image.processing

Craig: To get satellite imagery, try the EROS Data Center. It is a government facility in South Dakota. Sorry, I don't remember the city. This is the place that used to have all the Landsat images before the system went commercial (?). Did President Ron really sell that stuff?

Bob Garland
--
Robert Garland

1872. Re: Where to find Julian Date Table on Internet

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 04:47:10 UTC
From: hamilton@BIX.com
Message-ID: <hamilton.784615630@BIX.com>
Source record: 26473

It's reasonably simple to calculate Julian dates using an algorithm
that was printed in Computer Language magazine, December 1990. I
don't still have the original article handy, but I did rewrite the
code as a C shell script for my Hamilton C shell under NT or OS/2.
(Sorry, this will NOT work under the Berkely C shell on UNIX.)
Hopefully, the code will be clear enough that you can transcribe
it easily enough into C or Fortran or whatever's your favorite.
Anything you don't understand, just ask.

Here goes:

```
# Calculate the Julian day number for the specified date.
# Based on algorithms published in Computer Language magazine,
# December, 1990. Used with permission.

proc julian(month, day, year)
# The Julian day number is the number of days between noon GMT
# Jan 1, 4713 BC and that date. (Years B.C. are negative.)
local a, b, year_corr, Month, i
set Month = January February March April May June ^
July August September October November December
if (year == '') then
local dt
set dt = `dt`
@ year = $dt:3
if (day == '') then
@ day = month == '' ? $dt:2 : month
@ month = $dt:1
end
end
if (month !~ '[0-9]*') then
@ month = "$lower(month)*"
for i = 0 to 11 do
if (lower(Month[i]) =~ month) break
end
@ month = i + 1
end
if (month < 1 || month > 12 || year < -4713 || year > 2900) then
echo -2 julian: Invalid Date
return -1
end
# Correct for negative year.
if (year < 0) then
@ year++
@ year_corr = 1
```

```
@ b = 1
else
@ year_corr = b = 0
end
if (month <= 2) then
@ year--
@ month += 12
end
# Cope with the Gregorian calendar reform
if (year * 10000 + month * 100 + day > 15821015) then
@ a = year//100
@ b = 2 - a + a//4
end
@ a = floor(365.25 * year - year_corr) + ^
floor(30.6001 * (month + 1)) + day + 1720994 + b
# 4713 BC was not a leap year.
if (a < 59) @ a++
return a
end
```

1873. Re: Ku Band Satellite Receivers ?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 07:02:05 UTC
From: rdcole@crl.com
Message-ID: <rdcole.7.0007091F@crl.com>
Source record: 26476

In article <39uduo$cu5@forge.cc.gatech.edu> harold@cc.gatech.edu (Harold C. Forbes) writes:
>From: harold@cc.gatech.edu (Harold C. Forbes)
>Subject: Ku Band Satellite Receivers ?
>Date: 10 Nov 1994 19:30:16 -0500

>Anyone have a list of commercially available Ku band satellite
>recievers?

What are you wanting to receive ?

Most TVRO receivers with L band input can be converted by changin the LNB to a Ku-band LNB. There are Dual band Polorotors that allow C & Ku band operation on the same dish.

Ron Cole Internet:rdcole@crl.com ICBM:29 31.03 N
N5HYH CIS:70325,102 98 25.55 W
CE KZEP/KHBL AX25:N5HYH

1874. Re: How to get alias on amsat.org?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 08:57:57 UTC
From: graham@peachy.apana.org.au
Message-ID: <3a202l$abo@peachy.apana.org.au>
Source record: 26475

Serge Burjak (serge@systech.mhs.oz.au) wrote:
: The title says it all. How do I get an alias on amsat.org?

[...]
To obtain any of these services, just send a message to the address

listserv@amsat.org

For the moment, the maintenance of the AMSAT.ORG mailing lists and
remailing aliases is done manually. Later, this service will
probably be automated and you will have to follow a strict message
format. For now, you may send requests in free format. They will
usually be processed within a few days. In general, you will not
receive an explicit reply to your request. Be sure you specify:

1. Which mailing list(s) you want to receive

2. Your callsign, if any

3. The Internet address to be used, if different from the
one in your From: header.
[...]

--
+---+
Graham Broadbridge Internet <graham@peachy.apana.org.au>
FidoNet 3:711/907
vk2yui@vk2yui.ampr.org
+---+

1875. Balloon launch advice/materials needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 14:32:23 UTC
From: Jim Stafford-W4QO <w4qo@america.net>
Message-ID: <Pine.SV4.3.91.941112092932.12924A-100000@atl1.america.net>
Source record: 26479

I teach Meteorology at Milton High School in North Georgia. We want to do our own weather balloon launch and we are looking for groups who have done this and also sources for materials. I know that Edmond's has a nice sized balloon for about $17. Looking for radiosonde package. Saw these years back for almost nothing at surplus stores, but now I don't see them. Any ideas?

Thanks, Jim, W4QO
RadioActive Schools(sm)

1876. Can't get in Nasa Spacelink anymore! Plus.....

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 18:05:29 UTC
From: tomsunman@aol.com
Message-ID: <3a3059$k3s@newsbf01.news.aol.com>
Source record: 26477

Did Nasa spacelink BBS change? I used to go on it quite a bit but now I can't. I haven't used it in a while. I get dis-connected after I connect. Can't figure out why! Also, what's Celestial BBS' new number please. I know it's been changed. Thanks for the help!

Tom

1877. ARLK050 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 18:37:14 UTC
From: w1aw@arrl.org
Message-ID: <$arlk050.1994@ampr.org>
Source record: 26481
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK050
ARLK050 Keplerian data

ZCZC SK18
QST de W1AW
Keplerian Bulletin 50 ARLK050
From ARRL Headquarters
Newington, CT November 12, 1994
To all radio amateurs

SB KEP ARL ARLK050
ARLK050 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-66
1 23340U 94073A 94312.25000000 -.00000910 10343-4 70863-5 0 223
2 23340 56.9908 176.8638 0015656 294.8724 174.1298 15.91476332 721
AO-10
1 14129U 83058B 94311.32676368 -.00000015 00000-0 10000-3 0 3265
2 14129 26.7622 299.3734 6026132 225.3511 66.0715 2.05879904 57764
RS-10/11
1 18129U 87054A 94311.26346941 .00000041 00000-0 27969-4 0 9844
2 18129 82.9276 223.0834 0011880 354.3977 5.7043 13.72343884369533
UO-11
1 14781U 84021B 94310.56576702 .00000288 00000-0 56544-4 0 7513
2 14781 97.7830 318.6110 0011606 169.3215 190.8239 14.69266564571215
RS-12/13
1 21089U 91007A 94308.92369449 .00000080 00000-0 68703-4 0 7508
2 21089 82.9231 267.0689 0030778 77.5037 282.9552 13.74049687187973
AO-13
1 19216U 88051B 94311.77313192 -.00000578 00000-0 10000-4 0 9943
2 19216 57.6728 221.5174 7242728 354.2960 0.7033 2.09727084 17526
UO-14
1 20437U 90005B 94310.76860690 .00000053 00000-0 37647-4 0 506
2 20437 98.5842 33.5630 0011552 129.0962 231.1249 14.29862086249965
AO-16
1 20439U 90005D 94310.18902854 .00000042 00000-0 33360-4 0 8484
2 20439 98.5937 34.3825 0011579 131.2453 228.9728 14.29915986249892
```

```
DO-17
1 20440U 90005E 94311.24897052 .00000067 00000-0 42697-4 0 8498
2 20440 98.5949 35.8030 0011920 127.6618 232.5643 14.30056538250062
WO-18
1 20441U 90005F 94310.24734789 .00000045 00000-0 34147-4 0 8526
2 20441 98.5903 34.8008 0012471 131.2497 228.9760 14.30029556249927
LO-19
1 20442U 90005G 94309.72613139 .00000048 00000-0 35432-4 0 8478
2 20442 98.5955 34.5831 0012701 132.1376 228.0884 14.30127722249863
FO-20
1 20480U 90013C 94310.34766368 -.00000068 00000-0 -81630-4 0 7454
2 20480 99.0599 75.4542 0541272 17.5975 344.3085 12.83227255222368
AO-21
1 21087U 91006A 94309.25076832 .00000094 00000-0 82657-4 0 5353
2 21087 82.9437 38.3134 0036932 51.4163 309.0290 13.74546410188968
UO-22
1 21575U 91050B 94310.18725857 .00000072 00000-0 38991-4 0 5545
2 21575 98.4230 21.7218 0006985 223.4037 136.6589 14.36940909173473
KO-23
1 22077U 92052B 94311.06824367 -.00000037 00000-0 10000-3 0 4473
2 22077 66.0849 340.8303 0015177 253.3426 106.5929 12.86288640105160
KO-25
1 22830U 93061H 94309.68881537 .00000039 00000-0 32854-4 0 3526
2 22830 98.5402 19.7798 0011958 119.3404 240.8978 14.28070059 57895
IO-26
1 22826U 93061D 94311.25197435 .00000058 00000-0 41077-4 0 3443
2 22826 98.6415 25.5936 0009322 147.2919 212.8838 14.27746215 58109
AO-27
1 22825U 93061C 94310.23017478 .00000022 00000-0 26525-4 0 3461
2 22825 98.6393 24.5230 0008751 149.0577 211.1118 14.27640114 57950
PO-28
1 22829U 93061G 94311.23759661 .00000071 00000-0 46337-4 0 3381
2 22829 98.6391 25.6230 0010449 134.5637 225.6395 14.28049150 58117
Mir
1 16609U 86017A 94311.90979088 .00006205 00000-0 88366-4 0 8393
2 16609 51.6465 186.9978 0002016 214.7413 145.3448 15.57799320498413

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
November 15, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

1878. Re:Vk4CXX

Newsgroup: rec.radio.amateur.space
Date: 1994-11-12 20:32:00 UTC
From: gary.scafe%onsite.brisnet.org.au@f100.n200.z30.fidonet.org
Message-ID: <784701740.AA00049@onsite.brisnet.org.au>
Source record: 26480

Serge,
I am a user on CXX BBS via packet and I lost my sheet that had my passwords on it. Could you please send a message to Lee and ask him to ring me as I do not have his phone number. My phone is 8076070

God Bless
Take Care,
Gary VK4UUU
* Origin: Onsite Tech Support +61-7-807-8068 (30:200/100)

1879. Re: MIR uplink freq.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-13 02:00:23 UTC
From: tomsunman@aol.com
Message-ID: <3a3rvo$q2t@newsbf01.news.aol.com>
Source record: 26478

In article <rgolub.12.00179AD3@usa.net>, rgolub@usa.net (Roger Golub)
writes:

<Does anyone know what the uplink frequency and requirements are for the
<MIR?

<Thanking all in advance

<Roger, KB0PLS

Roger,
Uplink is 145.550, same as downlink - it's simplex. I don't know
what callsign is used at the moment. I hear one ham just came down to
Earth.
They are haveing power trouble so I hear only Europe is getting qso's for
now. That may have changed by now, may now have.

Tom (waiting for his callsign!)

1880. JVFAX v 7.0

Newsgroup: rec.radio.amateur.space
Date: 1994-11-13 13:01:32 UTC
From: thai@hk.super.net
Message-ID: <3a52nc$nv4@hk.super.net>
Source record: 26484

Can anyone point me to where I can find acopy of the latest JVFAX
software i.e V 7.0 please?

1881. FOR SALE -MINT FT-726R

Newsgroup: rec.radio.amateur.space
Date: 1994-11-13 19:36:01 UTC
From: jls@capedata.iii.net
Message-ID: <3a5prk$c2g@nic.iii.net>
Source record: 26483

Posting for a friend.....

FOR SALE:
Yeasu FT-726R (2m/430 all mode xciever). Meter
Lamps burned out, otherwise flawless.
Includes 2m and 430 boards, as well as satellite
module.

Will consider any offer over $900.00.

Jeffery Stutzman/N1LUY
Buzzards Bay, Ma.
MANU TENERE MARE SUPREMUS

1882. Space Probe Path Modelling Software ?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 01:55:28 UTC
From: zeus@myth.demon.co.uk
Message-ID: <784778128snz@myth.demon.co.uk>
Source record: 26490

Hello Folks.

I am looking towards the design of an experimental amateur space probe, such as was proposed to fly alongside Amsat Phase 3-D, and need some help finding modelling software. Earth orbit stuff and planetary orbit stuff is almost ten-a-penny compared with probe path design! *Any* help would be much appreciated!

Mike.

--

Michael S. Cowgill (Mike) _ " ....Cracking toast Gromit!... "
zeus@myth.demon.co.uk (That's me) _ Royal Blue Dragon
G1VOX@GB7WRG.GBR.EU 44.131.2.76 _ -==(UDIC)==-

1883. Re: AMRAD BBS Number

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 02:50:25 UTC
From: pblase@aol.com
Message-ID: <3a6j9h$csa@newsbf01.news.aol.com>
Source record: 26491

```
AMRAD BBS: (703)849-1161 300,1200,2400 bud N81
```

1884. APT-Satellites: Report NOV 13, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 08:04:32 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-141194080736@oskar.gmd.de>
Source record: 26485

```
Observed 50.61 deg NLat, 7.55 deg ELon; NOV 13, 1994

Following the satellite-name you read the approx.
hour (local=sun-time) and motion-direction of the
pass (N=northbound, S=southbound).
This time +/-1.5h is valid for the next 10+ days
to expect the satellite to be visible in range of
northern-hemisphere-stations, add 11h and switch
S<->N for another pass to observe.

NOAA-9 10:S APT 137.62 MHz On
NOAA-10 09:S APT 137.50 MHz On
NOAA-11 16:N APT 137.62 MHz AVHRR dead
NOAA-12 09:S APT 137.50 MHz On
Meteor 2-21 13:S APT 137.85 MHz ON again
Meteor 3-5 10:S APT 137.85 MHz On
OKEAN 1-7 12:N APT 137.40 MHz *OFF*

APT of OKEAN 1-7 was off during all available
passes. NOAA-11 transmits synch-bursts but imaging
is dead. Meteor 3-5 drifts into morning darkness.
Meteor 2-21 is active again, but the signal remains
weak as before. No other APT-signal 137.00-137.99 MHz
between 0700-1900 UT.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

1885. Re: JVFAX v 7.0

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 08:34:25 UTC
From: boyer@rd.bbc.co.uk
Message-ID: <Cz915E.B8v@bbc.co.uk>
Source record: 26486

Mr Chris Johannes Van Lint (thai@hk.super.net) wrote:
: Can anyone point me to where I can find acopy of the latest JVFAX
: software i.e V 7.0 please?

ftp.funet.fi

I can't remember the directory.

John B
John.boyer@rd.eng.bbc.co.uk

1886. Re: Solar radio emissions on FM?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 09:19:52 UTC
From: bpgore@indnet.win-uk.net
Message-ID: <24@indnet.win-uk.net>
Source record: 26492
Cross-posted to: sci.astro,rec.radio.amateur.space

In article <CyvCzJ.H3C@trc.amoco.com>, Joe Dellinger (zjad49@trc.amoco.com) writes:

> I know amateur radio enthusiasts can bounce signals off
>the moon with fairly modest antennas (meaning antennas that can fit
>in a North American's back yard), and get enough gain that they
>can *talk* real time to each other that way. Thus the signal to noise
>ratio must not be too bad.
>
Are you sure about this? I don't think the surface of the moon is
a reasonable radio reflector (otherwise we wouldn't have bothered to
put mirror cells on the moons surface to measure it's distance
accurately) and the signal would have had to pass through the
various atmospheric boundaries twice. Considering the (poor)
quality of signal that can be received by NASA from the shuttle, in
near orbit after a single passage through the atmosphere I would be
surprised if a voice signal could be succesfully bounced off the
moon.

> This got some of us thinking... if an amateur can *TALK*
>real time bouncing signals off the moon, how big an antenna would you
>need to look for near-Earth asteroids, if you were willing to broadcast
>for hours or days at a time and cross correlate with a looooonnnnnggg
>source waveform? It seems to me some of the same sort of equipment
>developed for SETI might be able to do this. With the plummeting price
>of computer power and memory, would such an experiment be within an
>amateur radio astronomer's reach?
>
When I was at University of Sheffield, England, circa 10 years
ago,we had a meteor radar that could track the ionisation trail
through the atmosphere, and was considered state of the art. What
you are suggesting is much more difficult, not from a computing
viewpoint (a basic PC could eat the problem) but from the signal
strength.

You are talking about sending a signal right out of the atmosphere
(several magnitudes harder than the meteor radar), bouncing it off
an asteroid (several magnitudes less radio reflective than a meteor
trail, and at least an order of magnitude further away) and
receiving a signal back through the atmosphere. You would also
have to do this for long enough to establish a trajectory against
a very noisy background.

I think your chances are slim to non-existent, but please prove me
wrong!

Peter Gore

1887. Re: JVFAX v 7.0

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 11:22:02 UTC
From: mklee@actrix.gen.nz
Message-ID: <Cz98wq.GuF@actrix.gen.nz>
Source record: 26488

In article <3a52nc$nv4@hk.super.net>, thai@hk.super.net (Mr Chris Johannes Van Lint) says:
>
>Can anyone point me to where I can find acopy of the latest JVFAX
>software i.e V 7.0 please?

It is available at ftp.uni-kl.de (131.246.94.94)
at directory /pub0/ham-radio/jvfax70
programme is jvfax70.zip, which is 720499 kbytes.

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

1888. Re: Satellite tracking software needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 12:10:50 UTC
From: n4hy@growler.ccr-p.ida.org
Message-ID: <N4HY.94Nov14121050@growler.ccr-p.ida.org>
Source record: 26495

Instantrak does not output to a file. Quiktrak 4.0a, available from AMSAT, does. See http://www.amsat.org/amsat for more information.

Author Quiktrak,
Bob
--
Robert W. McGwier | n4hy@ccr-p.ida.org: ham radio, scouts,
Center for Communications Research | astronomy, golf (o yea, & math!) ASM
Princeton, N.J. 08520 | Troop 5700, ACM Pack 53, Sanhican #2 WWW,
(609)-279-6240(v) (609)-924-3061(f)| District and Council Activities Chair.
(609-443-8963 (h) | I used to be a Buffalo . . . NE III-120
| proud parent in Brownie Troop 196

1889. Shuttle Packet Radio Test

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 12:28:36 UTC
From: ROBERTSM@JSC.MIL
Message-ID: <sec711e9.031@JSC.MIL>
Source record: 26487

The Shuttle packet radio system to fly on the next mission is being
tested by Ron, WA4SIR, in the Washington, DC area. The system will
respond to connect requests for WA4SIR-1 on 145.09 MHz with a message
indicating the QSO number for the shuttle test. The system may not
be available this week, but was available Sunday night for a time.
73 Mel W3MR

1890. ZSSRD 2

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 16:11:00 UTC
From: mora@bb.fido.de
Message-ID: <b26d56c8%fidonet@p41.f106.n6000.z242.fidonet.org>
Source record: 26489

Hello!

I'm looking for additional informations about ZSSRD 2 aka WSTRN.
It is a relaystation for communication with Mir. The position is 16 Deg.
West.

I wonder, what's the :

- Catalog number (NORAD/NASA)
- Intl. designation
- Launch date
- Launch vehicle
- Launch site
- Mass at launch

There are two transponders between 10.832 GHz and 11.5 GHz.
Somebody told me, that there are sporadic broadcasts from Mir.
Can these broadcasts be received with an ordinary TV-Sat-Equipment?
In Germany?

Bye Internet : mora@bb.fido.de
- Juergen - Fido(C&L) : 2:2449/422.41

1891. JVFAX 7.0 Bug Fix?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 16:53:06 UTC
From: magliaco@pilot.njin.net
Message-ID: <3a84li$cs7@pilot.njin.net>
Source record: 26494
Cross-posted to: rec.radio.amateur.misc,rec.radio.amateur.space

Has a release more current than 7.0 been made for JVFAX? Version 7.0 has
a few bugs in transmitting SSTV. On some images the program locks up
transmitting a grey-scale. On other images it rotates the left hand
with the right hand portion of the image.

I heard a rumor the bugs were fixed a new release made, but have not been
able to confirm the new release or even find it.

Does anyone have any other information? Inquiring minds want to know. :-)

73, de John, KD2BD

--
John A. Magliacane, KD2BD * /\/\ * Voice : 1-908-224-2948
Advanced Technology Center |/\/\/\| Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |\/\/\/| Internet: magliaco@pilot.njin.net
Lincroft, NJ 07738 * \/\/ * Morse : -.- -.. ..--- -... -..

1892. Re: Can't get in Nasa Spacelink anymore! Plus.....

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 20:28:07 UTC
From: Brian.Rehm@gsfc.nasa.gov
Message-ID: <Brian.Rehm-1411941528070001@fssb10.gsfc.nasa.gov>
Source record: 26497

In article <3a3059$k3s@newsbf01.news.aol.com>, tomsunman@aol.com (TOM SUNMAN) wrote:

> Did Nasa spacelink BBS change? I used to go on it quite a bit but now I
> can't. I haven't used it in a while. I get dis-connected after I connect.
> Can't figure out why! Also, what's Celestial BBS' new number please. I
> know it's been changed. Thanks for the help!
>
> Tom

New Celestial # is (205) 409-9280 (Alabama)

B. Rehm

1893. Sunsat

Newsgroup: rec.radio.amateur.space
Date: 1994-11-14 21:04:48 UTC
From: rolivier@seagoon.ee.sun.ac.za
Message-ID: <3a8jdg$jir@ucthpx.uct.ac.za>
Source record: 26498

SUNSAT micro-satellite launch on stream for 1996.

Stellenbosch University's SUNSAT micro-satellite is proceeding full steam for launch in January 1996 on a US Air-Force McDonnell Douglass (MDA) Delta 2 mission from Vandenberg Air-Force base in California.

Following a favourable programme review at Goddard Space Flight Centre in September, NASA and South Africa's Foundation for Research Development are setting up an inter-government Memorandum Of Understanding (MOU). NASA will arrange launch of SUNSAT in exchange for orbit data from a precision

NASA-supplied satellite navigation receiver in SUNSAT. The data will be used by NASA for gravity field research.

Successful technical meetings with SUNSAT engineers last week at Vandenberg Air-Force Base, and at McDonnell Douglass in California approved SUNSAT's ground operations plan and launcher interfaces, and enabled launch vehicle modifications to begin.

Stellenbosch is ready to start modal survey tests on SUNSAT's structure im mid November as required by NASA, but must still find sponsors for the solar panels and extendable boom (R400 000 total). These two USA items were originally planned to be sourced from the USA.

SUNSAT, is a small (50kg), cost effective imaging satellite that provides the core student activity in the Electronic Systems Laboratory in the Electrical Engineering Department at Stellenbosch University. Denel's termination of its satellite programme, an activity unrelated to SUNSAT, leaves the university laboratory as South Africa's only centre of expertise and development in this field. The laboratory regularly attracts foreign visitors, is starting to export technology, and led to a first Conference on Small Satellites in October, which attracted papers from four overseas countries.

SUNSAT is a low earth orbit satellite to provide high resolution images for environmental purposes, store and forward data communications, and is also part of a programme to interest school children in technology.

SUNSAT has been developed by 23 graduate engineering students at Stellenbosch and UCT since 1992, together with academic and technical personnel. Ninety percent of its computer, communications, and imaging technology is directly applicable in terrestrial systems, hence its support from industry in furthering engineering research and education.

Prof. G.W. Milne
SUNSAT Project Leader.

Phone +27 21 8084525
Fax 8084981

1894. MIR uplink freq.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 04:31:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.333.2922@freddy.supernet.ab.ca>
Source record: 26496

Hi Roger, The up-link frequency for Mir is 145.55 Mhz

As far as power requirements, I would suggest that you have a good look at your station. One watt with a good antenna can make it, but yes but, you'll have to have good timing and pray that no-one else is trying to uplink at the same time. I am not saying that you have to run a 150 watts either. I would suggest that you play around with maybe 25 watts or so and a small beam antenna.

Mir uplink 145.55 downlink 145.55

Good luck 73 de VE6LU Ernie

1895. MARS OBSERVER ANY/ALL INFO.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 05:43:11 UTC
From: n6@cyberden.com
Message-ID: <2456416253.5033528@cyberden.cyberden.com>
Source record: 26506

THIS IS NOT A SPAM * IT IS A QUEST FOR INFORMATION!

We will keep the closest confidence of reports regarding the MARS OBSERVER it's transmissions and it's demise... WE only have half the truth right now...we're still looking for the other 1/2...

The Mars Observer was a NASA probe to Mars that FAILED less than a week in Mars orbit..after transmitinting the SPHINX images from the MARS surface (available at CYBERDEN in Forbidden Subjects - Dir)... Just a few years earlier te Russians sent a probe to Mars and it also "disabled" - these probes are known to last decades in space on atomic batteries... What Gives???

WE want any and all info on the Mars Observer... Why did it disable? - Anyone got D/L'd images...

Alien sands...

Help..please...

send any all info to:

parasite@cyberden.com

THANK YOU for your help!

--
The CyberDen - Worldwide Alternative Music & Entertainment Network
415-472-5527 - Labels, Zines, Multimedia, Bands, Artists, Cultures
cyberden.com - Telnet and anonymous FTP -> Info: info@cyberden.com

1896. Re: Solar radio emissions on FM?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 13:47:27 UTC
From: JJENSEN@Mankato.msus.edu
Message-ID: <3aae5f$5gh@nitrogen.mankato.msus.edu>
Source record: 26503
Cross-posted to: sci.astro,rec.radio.amateur.space

In article <24@indnet.win-uk.net>, bpgore@indnet.win-uk.net (Peter Gore) says:
>
>
Just to solve one point of contention regarding this thread...

Yes, some hams have been bouncing signals off of the moon for years.
We call it, appropriately enough, "moonbounce."
I wouldn't exactly call the antennas that are used for this "modest,"
however, in contrast to those used by NASA,etc., they could be considered
modest.

1897. Re: Solar radio emissions on FM?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 14:30:36 UTC
From: zlau@arrl.org
Message-ID: <1994Nov15.143036.3848@arrl.org>
Source record: 26499
Cross-posted to: sci.astro,rec.radio.amateur.space

Peter Gore (bpgore@indnet.win-uk.net) wrote:
:
: In article <CyvCzJ.H3C@trc.amoco.com>, Joe Dellinger (zjad49@trc.amoco.com) writes:

: > I know amateur radio enthusiasts can bounce signals off
: >the moon with fairly modest antennas (meaning antennas that can fit
: >in a North American's back yard), and get enough gain that they
: >can *talk* real time to each other that way. Thus the signal to noise
: >ratio must not be too bad.

Yes, stations like KB2AH and OE9XXI can talk to each other on 1296
MHz. KB2AH has a homebrew 34 ft. dish and runs something like 500 watts.
OE9XXI runs about 1 kW to a 9 meter dish. I know that Tom's dish
barely fits in his residential yard.

: >
: Are you sure about this? I don't think the surface of the moon is
: a reasonable radio reflector (otherwise we wouldn't have bothered to
: put mirror cells on the moons surface to measure it's distance

returns about 5 %

: accurately) and the signal would have had to pass through the
: various atmospheric boundaries twice. Considering the (poor)
: quality of signal that can be received by NASA from the shuttle, in

Not true. School clubs around the world have talked to the
astronauts on amateur frequencies with little difficulty.
People have even heard the shuttle using a handheld transceiver.

: near orbit after a single passage through the atmosphere I would be
: surprised if a voice signal could be succesfully bounced off the
: moon.

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

1898. Summary of Nov. 12th balloon flight

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 14:59:27 UTC
From: djs19@ksu.ksu.edu
Message-ID: <3aaicf$t5a@matt.ksu.ksu.edu>
Source record: 26501

November 14.1994

Summary of November 12 balloon flight.

The SSOK (Sky Science Over Kansas) group launched and recovered its 9th payload.

Wind at the launch site played a major role in moving the release time up to 1336 UTC instead of 1500 UTC. Surface winds ranged from 10 to 15 knots with gusts to 20 knots. A large cotton sheet was draped over the balloon to carry it out of the inflation building and into an open area. This sheet was held by 6 people and it kept the balloon from being controlled by the wind. Once at the launch area a string lanyard was attached and the sheet removed, the balloon was allowed to ascend under lanyard control until high enough for the "runner" to get the payload underneath to release.

Ascent rate averaged between 800 to 900 feet per minute and a maximum altitude of 111,523 feet was reached. Recovery was 109 miles from the launch point which was near Topeka, Ks. This flight is the second in a row that the landing has been observed by a member of the recovery team. The aircraft that was using the low power beacon on 147.31 mhz for direction finding nearly intercepted the descending payload and parachute at 2500 feet. The aircraft circled the payload until touchdown and waited for the recovery team which was minutes behind.

Had the gps side of the payload failed the low power beacon would be the only way to locate it, and by powering it off of separate batteries it can last up to 10+ days.

More flights are planned for the future and should be just as interesting and fun as all the previous ones. Total participation was around 20+ for launch and recovery plus many more that listened in and gave reports. THANKS..

1899. DO-17 (DOVE decoding)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 17:01:01 UTC
From: sem2r@galen.med.Virginia.EDU
Message-ID: <CzBJ9p.4HL@murdoch.acc.Virginia.EDU>
Source record: 26502

I'm looking for a P.C. program to decode the Dove telemetry. My daughter is doing a science project on satellites and this seems like the perfect addition to her study, ie. the tracking and decoding of satellite telemetry.

Anyone know of an "ftp" site where I can get a decoding program (with instructions)?

Please E-mail direct to: sem2r@galen.med.virginia.edu

Thanks!! STACEY / WB4QKT

1900. Re: AO-27's Back!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-15 21:54:04 UTC
From: greg@core.rose.hp.com
Message-ID: <CzBwu4.2B2@icon.rose.hp.com>
Source record: 26504

Clinton Peebles (clinton.peebles@salmon.islandnet.com) wrote:
:
: G>Well, it seems that AO-27 is back in the analog FM Repeater mode. I worked
: G>VE7VVW Ron (*) on Saturday afternoon; he had a really nice signal, subject
: G>to the characteristic AO-27 fade. "The Fade" is possibly my problem
: G>in not having a circular antenna, but the effect is that a signal will be Q9
: G>one minute, and inaudible the next.
:
: Can you tell me the uplink/downlink frequencies? I had them written
: down somewere, but can't find them...

Uplink is 145.850, downlink 436.800, both FM.

Of course, since my original posting, I haven't heard a peep from the satellite since. Now I'm sure Murphy was a Ham...

Greg KD6KGW

1901. Working Shuttle - Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 01:09:27 UTC
From: asirene@ntuvax.ntu.ac.sg
Message-ID: <1994Nov16.090927.1@ntuvax.ntu.ac.sg>
Source record: 26319

Is there SAREX on Shuttle Atlantis? What are the 2m working frequencies?
What is the call to use for calling the shuttle and frequencies? THanks.

73 de 9V1ZV,
Daniel

1902. Antennas for Pacsat dwnlink.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 01:37:40 UTC
From: wk@muscle.frc.maf.govt.nz
Message-ID: <WK.94Nov16143740@muscle.frc.maf.govt.nz>
Source record: 26500

I am trying to get a mode jd microsat station up and running, playing around with a TAPR PSK kit, homebrew UHF-> 10 m converter, IC725, TNC2 etc.

Also, I am trying different antennas for the downlink. So far I have built and tried a Lindenblad and a GP. Not getting terribly good signals, I recently built an MRF66 masthead preamp which made a big difference.

Anyway, on most passes I can get a solid lock if signals are over S3, and I start copying frames when signals get up to S4-S5. With signals below S5, the modem is locked on, and 3 segments of the level bar graph light up, indicating a noisy signal. As soon as signals get up to S5, only one or two segments light up brightly, and I can copy the frames. The threshold point seems to be fairly sharp.

Nevertheless, with the small omni directional antennas I still get lots of fade outs and violent QSB. The GP produces usable signals only on few passes, when the sat passes to the west of me, and low above the horizon. Presumably, the polarisation and takeoff happen to match my GP and signals are remarkably stable for minutes on end. Most of the time however, I don't copy any frames at all.

The PSK mode seems to work well, but still it appears to want a fair amount of signal and good S/N, certainly a fair bit more than HF AMTOR.

As I am still in the process of improving the downlink performance, I was wondering if I need to go to directional, tracking antennas to solve the marginal copy. Do people here use omni antennas and get reliable results, or should I be able to get the present setup to work?

My next step is to change the GP for the Lindenblad again (this time with the preamp), trading off early copy for better signals during the middle of the pass.

Any hints regarding downlink antennas appreciated, will summarise if enough interest.

Cheers, Wilbert.

--
Wilbert Knol, Acoustics Group, MAF Marine Research, Wellington, New Zealand.
Usenet: wk@frc.maf.govt.nz PACKET:ZL2BSJ@ZL2WA.NZL.OC
AMPR:[44.147.180.88] AX25 NET/ROM TCP/IP MBX 146.625 147.075 MHz 24 hrs.

1903. Re: Meaning of NASA Keplerian Elements

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 02:00:54 UTC
From: garym@alsys.com
Message-ID: <CzC89I.73s@alsys.com>
Source record: 26509

In <26087.9411120059@life.ecs.soton.ac.uk> lsn92@ecs.soton.ac.uk writes:
>Are there text books/published articles cover all the Keps described in
>the NASA Keps Set?
>What are n.mi. (in terms of kilometers), apsidal rotaion, nodal
>regression, nodal period, epoch rev.?
>Are there any resources about this subject on the Internet?

I put the following summary together from some resources I found plus some explanations for Gil Carman (WA5NOM). I originally put it together to give out to people on the Shuttle Elements Mailing List since this is a Frequently Asked Question from new list subscribers. Hope this answers some of your questions. This does not specifically refer to the NASA two line element sets but many of the fields are the same.
--GaryM

----------<cut here>----------<cut here>----------<cut here>----------

The Keplerian Elements Sets are orbital tracking data is intended to be used in by a satellite tracking programs. They use the data to compute where the satellite should be at any particular moment in time based on it's previous location and known velocity. The data comes in various formats, one is called NASA Two Line Elements (TLE) and another format is the AMSAT format show below. There are other formats and other coordinate systems used.

Here is a sample of AMSAT format elements with a short explanation on each data item.

Satellite: STS-65
Catalog number: 23173
Epoch time: 94201.28966185 (20 JUL 94 06:57:06.78 UTC)
Element set: GSFC-042a
Inclination: 28.4662 deg
RA of node: 281.0136 deg Space Shuttle Flight STS-65
Eccentricity: 0.0003249 Keplerian Elements
Arg of perigee: 78.0464 deg
Mean anomaly: 282.0512 deg
Mean motion: 15.91226612 rev/day Semi-major Axis: 6676.9815 Km
Decay rate: 5.4802E-04 rev/day*2 Apogee Alt: 300.76 Km
Epoch rev: 186 Perigee Alt: 296.42 Km

Satellite - This is the common usage name of the spacecraft.

Catalog number (object number) - This is the chronological reference number assigned by USSPACECOMM (formerly NORAD) to each new spacecraft when it is established in orbit. A particular spacecraft may be referred to either by its name or catalog number.

Epoch time - This parameter is the Julian date to which the other parameters are referred. The Julian date consists of the last two digits of the year (94), a 3 digit day of the year (July 20 is the 201st day of 1994), and the fraction of the day (Noon is .5000). Universal time (UTC) is used.

Element set - This parameter is the set sequence number as issued by NASA and this number is modulo 999 (range 1-999).

Inclination - This parameter is the orbit inclination in degrees. This is the angle between the orbital plane and the equatorial plane of the Earth.

Right ascension of ascending node - This parameter is the angle in degrees to the point where the ascending orbit crosses the equater (where the spacecraft is moving from south of the equator to north of the equator) at the epoch time specified in the set. It's measured relative to the inertial X axis (first point of Aires), like star coordinates.

Eccentricity - This parameter is the orbit eccentricity. A value of 0.0 would be a perfectly circular orbit.

Argument of perigee - This parameter is in degrees for the epoch time specified in the set. It is the angle measured in the orbit plane in the direction of motion, from the ascending node to the point of perigee.

Mean anomaly - The angle (also measured in the orbit plane in the direction of motion) from perigee to the satellite. Finding the actual position of the satellite involves solving Kepler's equation to convert mean anomaly to eccentric anomaly and true anomaly, but we won't go into that here.

Mean motion - This parameter is in orbit revolutions per day.

Decay rate - This parameter is one half of the first time derivative of mean motion (Ndot/2). They did that for convenience, since that's how that term appears in the series expansion for propagating the mean anomaly. (The next term to the right of Ndot/2 in the NASA 2-line elements is the second time derivative of mean motion, divided by 6 (Nddot/6). Normally this term is zero if the mean motion is reasonably linear; however, non zero values will start showing up for very low altitude satellites with decay rates that are increasing with time.)

Epoch revolution - This parameter is the orbit number count at the epoch time specified in the set.

# # #

1904. NANO-SAT

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 03:24:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.340.2922@freddy.supernet.ab.ca>
Source record: 26320

Hi Mike,
See that your up to something there and I'm interested?
So what are you designing or building....I had the idea of building a NANO-SAT. Small and easy to get rides into orbit. Read your comments on a Lunar Orbiter/Lander and thought that it sounded good but to darn costly. What do you think of maybe a long range bird, like a 100,000km orbit???
I await you thoughts of endever and sorry can't help with the software. I'll keep my eyes open for you.

73 de Ernie VE6LU
(ernie.koch@freddy.supernet.ab.ca)

1905. Re: Solar radio emissions on FM?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 15:56:08 UTC
From: dtiller@rmc.edu
Message-ID: <3ada2o$j55@gnd0.rmc.edu>
Source record: 26508
Cross-posted to: sci.astro,rec.radio.amateur.space

Joel Jensen, KF0VB (JJENSEN@Mankato.msus.edu) wrote:
: In article <24@indnet.win-uk.net>, bpgore@indnet.win-uk.net (Peter Gore) says:
: >
: >
: Just to solve one point of contention regarding this thread...

: Yes, some hams have been bouncing signals off of the moon for years.
: We call it, appropriately enough, "moonbounce."
: I wouldn't exactly call the antennas that are used for this "modest,"
: however, in contrast to those used by NASA,etc., they could be considered
: modest.

And few of them 'talk', either. The only really useful mode is CW (Morse
code) due to the extreme path loss and the various fading modes between
here and there (and back!). A slow CW signal is only ~100Hz wide, where
a SSB phone transmission is ~2.7kHz wide. Usual ERP levels are well over
1kW, too. Not exactly cordless phone power levels, I'd say... :-)
--
David Tiller | Network Administrator | Voice: (804) 752-3710 |
dtiller@rmc.edu | n2kau/4 | Randolph-Macon College| Fax: (804) 752-7231 |
Don't let your SKS get | P.O. Box 5005 | ICBM: 37d 42' 43.75" N |
"Tainted with Defilement!" | Ashland, Va 23005 | 77d 31' 32.19" W |

1906. Q:SatTracking for os Linux

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 16:15:00 UTC
From: hendrik@flydut.com
Message-ID: <5_zucrL_OTB@flydut.com>
Source record: 26505

Wednesday / 16 Nov 94

LS,
Please, can anyone tell me, on what ftp-server I can find a nice satellite-tracking program like Quiktrak, InstantTrack or PCTrack (all DOS), for os LINUX ?
Many thanks for your answer.
regards
Hendrik Jassies.

==========
HENDRIK JASSIES // E-Mail: hendrik@flydut.com // Compuserve: 100117,630

1907. HUBBLE PICTURES FROM SPACE?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 17:22:58 UTC
From: Tyler Harpster <TJH112@psuvm.psu.edu>
Message-ID: <94320.122258TJH112@psuvm.psu.edu>
Source record: 26325

I'm posing this question: We can easily see the weather satellite pictures on home computers with some receiving equipment. How tough is it to see the pictures Hubble sends back? Does it only take pictures when tasked to? I do not know for sure, but assume it is not in geosynchronous orbit and would have to be tracked. Any frequencies? tylerN3SPD

1908. Ham-Space Digest V94 #322

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 18:36:39 UTC
From: 100407.436@compuserve.COM
Message-ID: <941116183639_100407.436_BHG74-3@CompuServe.COM>
Source record: 26322

PLEASE UNSUBSCRIBE ME FROM THIS LIST !

I've been fighting with the "request" server, but no help is available. I've written to the human administrator, no answer... Can someone make this stop ? Please no answer in
this bulletin, but to 100407.436@compuserve.com

1909. Are there stars between the galaxies?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 21:42:36 UTC
From: dale.eason@stpaul.ncr.com
Message-ID: <dale.eason.2.0@stpaul.ncr.com>
Source record: 26507
Cross-posted to: sci.astro,rec.radio.amateur.space

I have been reading that there is a halo of stars around our galaxy. That started me to thinking: What defines the edged of the galaxy and are there isolated stars (not bound to any particular galaxy) between the galaxies? Do we know anything about what the inter galatic medium is made of? Is it just a less dense version of innergalatic medium?

Thanks,
Dale Eason
dale.eason@.stpaul.ncr.com

1910. AO-27 Information??

Newsgroup: rec.radio.amateur.space
Date: 1994-11-16 21:49:04 UTC
From: lakki@krksun.krk.fi
Message-ID: <1994Nov16.214904.29921@krk.fi>
Source record: 26316

Can someone tell me information about AO-27. I know something but...

-Schedule? Is the satellite in bent pipe FM repeater mode all the time
or is there a schedule?
-Someone told me that AO-27 is open only weekends. Is it so?

/Erik
--
E R I K F I N S K A S O H 2 L A K
=---=
INet: Lakki@krk.fi -=- Sammalkalliontie 4 E 40
AX.25: OH2LAK@OH2RBJ.FIN.EU -=- FIN - 02210 Espoo 21
AmprNet: OH2LAK@OH2LAK.AMPR.ORG -=- GSM: +358-(9)40-500 6800
=---=
H A M R A D I O - T H E R E A L T H I N G

1911. SatTrack for LINUX

Newsgroup: rec.radio.amateur.space
Date: 1994-11-17 00:42:37 UTC
From: manfred@isi5.ssl.berkeley.edu
Message-ID: <3ae8tt$evm@agate.berkeley.edu>
Source record: 26317

> From: hendrik@flydut.com (Hendrik Jassies)
> Subject: Re: Q: SatTracking for os Linux
>
> Please, can anyone tell me, on what ftp-server I can find a nice satellite-
> tracking program like Quiktrak, InstantTrack or PCTrack (all DOS), for
> os LINUX ?
> Many thanks for your answer.
> regards
> Hendrik Jassies.

Bob Kupiec was kind enough to provide an FTP site from which SatTrack V2.0
can be obtained. Do the following:

ftp ftp.jvnc.net (128.121.50.2)
login anonymous
binary (this line is important!)
cd /pub/priv/kupiec/sattrack
get sattrack.V2.0.tar.Z

Place this file into your Unix home directory, uncompress it, and then type
'tar xvpf sattrack.V2.0.tar'. This will unbundle the distribution file
and will create all necessary sub-directories. Then look into the documentation
file 'sattrack.doc' in SatTrack/doc for instructions how to compile sattrack
(and some other auxiliary programs). It should compile perfectly on at least
Sun-3's (SunOS 4.0.3), SPARCstation IPCs (SunOS 4.1.1) and i386 laptops
running Linux. Make sure the compiler and linker flags in the Makefile
are configured properly!

Future releases are expected to feature the SDP4 model for satellites with a
period of more than 225 minutes and X Window graphics with a color world map
tracking chart (V3.0).

Version 2.2 is an improved version of V2.0 and will be ready for release
very soon. Stay tuned ...

Please let me know how the installation went and if you encountered any
problems, bugs or imperfections.

Manfred --- W6/DL5KR

Manfred Bester
Space Sciences Laboratory
University of California
Berkeley, CA 94720, USA
(510) 642-8497
manfred@ssl.berkeley.edu

1912. help

Newsgroup: rec.radio.amateur.space
Date: 1994-11-17 04:57:07 UTC
From: daughert@indy.NET
Message-ID: <199411170457.AA15724@IndyNet.indy.net>
Source record: 26510

help

Mark Daugherty Internet: daughert@indy.net
Electronic Data Systems, Inc
Indianapolis, IN - USA

- Opinions expressed are my own and do not represent those of my employer -

1913. Dear schmuck - was: MARS OBSERVER ANY/ALL INFO.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-17 07:22:44 UTC
From: Philip Chien <Pchien@ids.net>
Message-ID: <3af0c4$5dl@paperboy.ids.net>
Source record: 26326

In article <2456416253.5033528@cyberden.cyberden.com> n6, n6@cyberden.com writes:
>We will keep the closest confidence of reports regarding the MARS OBSERVER
>it's transmissions and it's demise... WE only have half the truth right >now...we're still looking for the other 1/2...

First of all - this is an amateur radio group - rec.amateur.radio.space. This is not alt.sci.skeptic or alt.bozo.weekly-world-news

>The Mars Observer was a NASA probe to Mars that FAILED less than a week in
>Mars orbit

Actually it failed a couple of days before entering orbit around Mars due to a faulty design in its propulsion system. The details are publicly available and can be verified by examining the backup spacecraft still on the ground.

> after transmitinting the SPHINX images from the MARS surface
>(available at CYBERDEN in Forbidden Subjects - Dir).

Sorry - the only image which the Mars Observer Camera (MOC) transmitted back was a long distance shot showing half of the planet from a fairly far distance, not much better than what can be done from Earth. Any other images which you've seen have come from supermarket tabloids and their sources.

> Just a few years
>earlier te Russians sent a probe to Mars and it also "disabled" - these >probes are known to last decades in space on atomic batteries... What >Gives???

Well you're wrong on three points. Most planetary orbiters (not probes) do *NOT* last decades. For a planetary mission the typical duration is about two to three years plus travel time to the planet. And almost all of them use solar cells. The only inner solar system scientific spacecraft to use atomic batteries were the Apollo ASLEP packages and Viking landers.

What are your sources for your aleged information? Do you have anybody as a reference which has ever been published by the American Geophysical Society, American Astronomical Society, National Academy of the Sciences, or any other recognized scientific organization. (And the Federation of American Scientists does *NOT* count - they're almost as bad as the supermarket tabloids!)

For the record - my sources are the principal investigator for the Mars Observer Camera, the project manager, project scientist, and the head of the board which investigated the Mars Observer failure. In my experience they are not lying to me, and have adequately explained the reason for Mars Observer's demise. Hogland and the like have not done so.

Philip Chien
no sig yet

1914. Re: Working Shuttle - Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-17 07:26:42 UTC
From: Philip Chien <Pchien@ids.net>
Message-ID: <3af0ji$5dl@paperboy.ids.net>
Source record: 26323

In article <1994Nov16.090927.1@ntuvax.ntu.ac.sg> ,
asirene@ntuvax.ntu.ac.sg writes:
>Is there SAREX on Shuttle Atlantis? What are the 2m working frequencies?
>What is the call to use for calling the shuttle and frequencies? THanks.

not on the mission which just finished (STS-66). While Ellen Ochoa has a valid amateur radio license the decision was made not to manifest SAREX on that flight for various reasons.

The next SAREX mission will be STS-67, currently scheduled for late February 1995. It will include several hams on the crew, most notably Dr. Ron Parise WA4SIR.

I'm working on a SAREX FAQ document and plan to post it by early January so it will be distributed well before the mission.

Philip Chien KC4YER

1915. AO-21 Telemetry

Newsgroup: rec.radio.amateur.space
Date: 1994-11-17 16:54:01 UTC
From: etjfonte@ci.ua.pt
Message-ID: <CzF8A3.nz@news.ci.ua.pt>
Source record: 26311

As we now AO-21 has been off (Why ???) here's some TLM colected by from packet

From: EB4EUF@EB4BFL.EAM.ESP.EU
To : AO-21@AMSAT

12/10/94 13:08 UTC Rudak II (AO-21) TLM
==========
R:62 14:08 RUDAK2>BEACON>UI,C,F0:
Many thanks in advance on behalf of the AO-21 command team
for helping us to investigate this phenomenon.
73 de Gerhard DG2CV @DB0AAB.#BAY.DEU.EU
R:00 14:08 RUDAK2>EPROM-5>UI,C,25:
RUDAK-2 EPROM-Test
-24921 11:22 00003D 000000
-24921 11:22 00003D 000001
-24921 11:22 00003D 000000
-24921 11:24 00003D 000001
-24921 11:24 00003D 000000
R:00 14:08 RUDAK2>BEACON>UI,C,F0:
++ Hi, this is the RUDAK-II experiment on AMSAT OSCAR 21 ++
R:09 14:08 RUDAK2>TLM-1>UI,C,F0:
RUDAK-II Telemetry (94-10-12 13:09:13):
voltages RM1-TCMD-interface lock memory errors
5V-R1 : 0.63 V 1-TX-ON : on RX2: * single: 74
5V-RTX: 5.02 V 2-RX12&48: off RX3: - multi : 0
R:23 14:08 RUDAK2>TLM-2>UI,C,F0:
5V-RAM: 4.95 V 3-RNG : on AGC
total current 4-soft: 0.2 V RX3: 146 temperature
14V-I : 309 mA RX4: 198 37.2 deg C
chksum: 0 upcnt: 0 stack: 10 noint: 0
R:01 14:08 RUDAK2>TLM-3>UI,C,F0:
RAMDISK:
wash sectors memory errors audio sectors picture sectors
start: 2498 single: 29364 start: 128 start: 2500
end : 2499 multi : 9587 end : 1301 end : 2620
ptr : 2498 sample freq: 8000 chksum: -29338 (16074)
R:05 14:08 RUDAK2>BEACON>UI,C,F0:
RUDAK-II Schedule: (down 145.987, up 435.016)
min/10 Beacon Mode
0..8 FM Repeater
9 AFSK TLM
R:00 14:08 RUDAK2>WEFAX-1>UI,C,F0:
WEFAX General Info:
Mode : MGCS, Subcarrier 2400Hz, DSB max=white, Start 300Hz(3s),

Stop 450Hz(5s), Phasing signal (5% bl, 95% wh),
Sync (1st 40 Pixels), 800x800 Pixels, 4 lines/sec., module 267
R:00 14:08 RUDAK2>WEFAX-2>UI,C,F0:
WEFAX Current Settings:
Picture:
level deviation ratio
white 127 5.7 kHz 10
black 13 0.6 kHz 1
Grayscale steps: 115
Bandwidth: 21 kHz
R:52 14:08 RUDAK2>CHKSUM>UI,C,F0:

�e�J*$`S��1K_���u□'��
!U���db;~□v□R□□□C2%CH□□□□N□pɳ_j□□□ Ny-4@□
>□□□w□□□□Cl□$□P□7□□□□"□$P□□□□G□S□□`ENj'□□Kq
#Nb0□b>□□□G□□2=□□@□□Q&□□1□□□T□F\v□U□K□6'Wh{□\□□□□$/□V-Z□I□□□□□□D7□
j□□[>W□qʃ

R:15 14:08 RUDAK2>BEACON>UI,C,F0:
*** AO-21-TLM wanted! ***
Due to multi-bit errors in the RAMDISK and the EPROM the AO-21 command team
is looking for AFSK Packet Telemetry of RUDAK II from Sept. 15th to 18th.
R:76 14:08 RUDAK2>BEACON>UI,C,F0:
If anybody has any copy of that please send it
- via PACKET to Robert: DD4YR @DB0AAB.#BAY.DEU.EU
- or via INTERNET to Peter : db2os@amsat.org
R:00 14:08 RUDAK2>BEACON>UI,C,F0:
Many thanks in advance on behalf of the AO-21 command team
for helping us to investigate this phenomenon.
73 de Gerhard DG2CV @DB0AAB.#BAY.DEU.EU
R:00 14:08 RUDAK2>EPROM-5>UI,C,25:
RUDAK-2 EPROM-Test
-24921 11:22 00003D 000000
-24921 11:22 00003D 000001
-24921 11:22 00003D 000000
-24921 11:24 00003D 000001
-24921 11:24 00003D 000000
R:67 14:08 RUDAK2>BEACON>UI,C,F0:
++ Hi, this is the RUDAK-II experiment on AMSAT OSCAR 21 ++
R:09 14:08 RUDAK2>TLM-1>UI,C,F0:
RUDAK-II Telemetry (94-10-12 13:09:35):
voltages RM1-TCMD-interface lock memory errors
5V-R1 : 0.61 V 1-TX-ON : on RX2: * single: 74
5V-RTX: 5.02 V 2-RX12&48: off RX3: * multi : 0
R:27 14:08 RUDAK2>TLM-2>UI,C,F0:
5V-RAM: 4.95 V 3-RNG : on AGC
total current 4-soft: 0.2 V RX3: 148 temperature
14V-I : 324 mA RX4: 198 37.2 deg C
chksum: 0 upcnt: 0 stack: 10 noint: 0
R:09 14:08 RUDAK2>TLM-3>UI,C,F0:
RAMDISK:

wash sectors memory errors audio sectors picture sectors
start: 2498 single: 29425 start: 128 start: 2500
end : 2499 multi : 9589 end : 1301 end : 2620
ptr : 2498 sample freq: 8000 chksum: -29320 (16074)
R:28 14:08 RUDAK2>BEACON>UI,C,F0:
RUDAK-II Schedule: (down 145.987, up 435.016)
min/10 Beacon Mode
0..8 FM Repeater
9 AFSK TLM
R:00 14:08 RUDAK2>WEFAX-1>UI,C,F0:
WEFAX General Info:
Mode : MGCS, Subcarrier 2400Hz, DSB max=white, Start 300Hz(3s),
Stop 450Hz(5s), Phasing signal (5% bl, 95% wh),
Sync (1st 40 Pixels), 800x800 Pixels, 4 lines/sec., module 267
R:00 14:08 RUDAK2>WEFAX-2>UI,C,F0:
WEFAX Current Settings:
Picture:
level deviation ratio
white 127 5.7 kHz 10
black 13 0.6 kHz 1
Grayscale steps: 115
Bandwidth: 21 kHz
R:15 14:08 RUDAK2>BEACON>UI,C,F0:
*** AO-21-TLM wanted! ***
Due to multi-bit errors in the RAMDISK and the EPROM the AO-21 command team
is looking for AFSK Packet Telemetry of RUDAK II from Sept. 15th to 18th.
R:75 14:08 RUDAK2>BEACON>UI,C,F0:
If anybody has any copy of that please send it
- via PACKET to Robert: DD4YR @DB0AAB.#BAY.DEU.EU
- or via INTERNET to Peter : db2os@amsat.org
R:00 14:08 RUDAK2>EPROM-5>UI,C,25:
RUDAK-2 EPROM-Test
-24921 11:22 00003D 000000
-24921 11:22 00003D 000001
-24921 11:22 00003D 000000
-24921 11:24 00003D 000001
-24921 11:24 00003D 000000
R:66 14:08 RUDAK2>BEACON>UI,C,F0:
++ Hi, this is the RUDAK-II experiment on AMSAT OSCAR 21 ++

--
|---|
Jose' Miguel M.B.Fonte	Aveiro University - PORTUGAL - EUROPE
Box 108 - 4801 Guimaraes - PT.	Electronics and Telecomunications Dept.
E-mail : etjfonte@ci.ua.pt |---|-----------------------------------
PACKET : CT1ENQ@CT1EDY.CTAV.PRT.EU	Ham:CT1ENQ - Univer.Club: CT6ARU
Don`t steel. The government hates competition!

1916. sat03nov.zip - Fast Satellite Tracker by DL3HRT & DL3HZM

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 00:58:02 UTC
From: hansky@Igel.Physik.TH-Zwickau.DE
Message-ID: <9411180058.kp5334@SimTel.Coast.NET>
Source record: 26312
Cross-posted to: comp.archives.msdos.announce,rec.radio.info,rec.radio.amateur.space

I have uploaded to SimTel, the Coast to Coast Software Repository (tm),
(available by anonymous ftp from the primary mirror site OAK.Oakland.Edu
and its mirrors):

SimTel/msdos/hamradio/
sat03nov.zip Fast Satellite Tracker by DL3HRT & DL3HZM

This program allows to track up to 700 satellites. The tracking is done
eigther in real-time or in the delta-t mode. 16 satellites are presented
simultaneously in the real time table.

Features:
* up to 700 different satellites
* using AMSAT and NASA format
* optional calculation of AOS (Appearance Of Satellite) and maximum
elevation
* optional acustic signal triggered by AOS/LOS
* prediction protocol to textfile
* prediction also for two sites
* select the second observer from up to 2000 locations
* locator-coordinate-distance computation
* worldmap with spotlight
* azimuth-/elevation graphic with optional presentation of horizon
* information system for particular satellites
* bi-lingual (English and German)
* all data files are text-type files
* selecticve update of element sets when using NASA format
* display of the sun terminator

Minimum configuration:
* PC-AT 286 and above
* abt. 200kByte disc capacity
* abt. 400kByte free memory when using graphics
* EGA/VGA-graphic

Optional:
* Arithmeticprocessor
* Mouse

sat03nov.zip has replaced sat04aug.zip.

ShareWare. Uploaded by the author.

Karsten
- -
Karsten Hansky (DL3HRT)

e-mail: hansky@igel.physik.th-zwickau.de
AX25 : DL3HRT@DB0LPZ.#SAX.DEU.EU
Phone : +49 0375 536 1429

1917. Re: Are there stars between the galaxies?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 02:15:14 UTC
From: tomsunman@aol.com
Message-ID: <3ah2ni$jio@newsbf01.news.aol.com>
Source record: 26313
Body handling: HTML body converted to readable text

In article , dale.eason@stpaul.ncr.com
(Dale Eason) writes:

1918. ZSSRD 2

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 03:08:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.353.2922@freddy.supernet.ab.ca>
Source record: 26318

Hi, I am not sure of the info you need? A good place that you can try is the Marshall Space Flight Centre BBS in the USA (205) 895-0028 running 9600 baud. Sorry, don't know if they have email availible.

They do have info on just about all satellites in orbit as well as future projects. Good Luck with your quest.

73 de Ernie VE6LU

1919. Re: HUBBLE PICTURES FROM SPACE?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 14:57:50 UTC
From: zeus@myth.demon.co.uk
Message-ID: <785170670snz@myth.demon.co.uk>
Source record: 26314

Frequencies would not help. The HST communicates with the TDRS satellites, not directly to the ground. The TDRS sats use a very narrow beam, high bandwidth/data rate and are almost cetainly encrypted.

Mike.

1920. STS-64 QSL Address?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 15:31:56 UTC
From: smyla@sol.cms.uncwil.edu
Message-ID: <3aihdc$bvq@sol.cms.uncwil.edu>
Source record: 26315

Does anyone have the address to send QSL card requests for the
STS-64 mission?

-Brian

1921. Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 17:33:25 UTC
From: dwetzel@rain.com
Message-ID: <dwetzel.7.00118F14@rain.com>
Source record: 26324

Anybody know of an ftp site that keeps current satellite kep info for all 200 or so of the commonly tracked objects?

Thanks!

1922. Re: DSP-93

Newsgroup: rec.radio.amateur.space
Date: 1994-11-18 21:42:29 UTC
From: kchen@apple.com
Message-ID: <3aj745$1lb@apple.com>
Source record: 26321

rparsons@bga.com (Ronald G. Parsons) writes:

>I have been beta testing the DSP-93 for several months. I have used it on
>9600 bps satellites and 1200 bps terrestrial packet. Others in the group
>have used it with the PSK birds and HF "packet".

Hi Ron,

I envy you.

I called TAPR earlier this week and was told that the next batch won't be
available until March and they will accept an order until January.

I ordered it sight unseen, and asked for the brouchures to be sent
after I made the order :-).

Could you tell me what the development tools (assemble, compiler, etc)
are like? (I presume the DSP code is in RAM and I don't have to burn a new
set of ROM each time?) And will I be able to get hold of the tools
before the next batch of kits ship?

Also, could you tell me if the DSP-93 can be run standalone (from a ROM)
without using a PC, once the code is developed?

My objective is the best HF modem one can build for RTTY :-). I used
to do DSP even before the days it was called DSP (certainly before Parks
published his Remez-exchange program) and it would be fun to play with
that stuff again. Have been into graphics algorithms lately.

73

Kok Chen, AA6TY kchen@apple.com
Apple Computer, Inc.

1923. Re: STS-64 QSL Address?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-19 05:18:14 UTC
From: hrsblackwell@hrs.gsfc.nasa.gov
Message-ID: <hrsblackwell-1911940018140001@n3kwu.gsfc.nasa.gov>
Source record: 26327

In article <3aihdc$bvq@sol.cms.uncwil.edu>, smyla@sol.cms.uncwil.edu
(Brian Smyla) wrote:

Does anyone have the address to send QSL card requests for the
STS-64 mission?

-Brian
All SAREX QSL requests are handled by ARRL now. I believe you send to the
standard address and note that you are QSL/SWL'ing STS-64.
--
Jim Blackwell
GHRS Project
Computer Science Corporation
NASA/GSFC Code 681.0
Greenbelt, MD 20771

1924. Re: DO-17 (DOVE decoding)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-19 19:10:59 UTC
From: miles@mail.utexas.edu
Message-ID: <miles-191194131008@slip-1-5.ots.utexas.edu>
Source record: 26331

```
> I'm looking for a P.C. program to decode the Dove telemetry. My
> daughter is doing a science project on satellites and this
> seems like the perfect addition to her study, ie. the tracking
> and decoding of satellite telemetry.
>
> Anyone know of an "ftp" site where I can get a decoding program
> (with instructions)?
```

And how about a Macintosh version? Thank you!

```
= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
_ Miles Abernathy, N5KOB = I have a spelling checker.
| |__ miles@mail.utexas.edu = It came with my PC.
_| | POB 7580, Austin TX 78713 = It plane lee Marx four my review
\ * / University of Texas @ Austin = Miss steaks aye kin knot sea.
\/ tel. (512) 471-6521 U.S.A. = (from mini-JIR)
= = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
```

1925. Re: Am I the only one having trouble to pick up MIR?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-19 21:10:13 UTC
From: gregm50685@aol.com
Message-ID: <3alpjl$ndc@newsbf01.news.aol.com>
Source record: 26333

In article <38hg6c$kev@news.tamu.edu>, reykowsk@eemips.tamu.edu (Arne Reykowski) writes:

Arne: According to AMSAT, MIR is offline on packet and voice right now. They plan on restarting Packet in the next 3 weeks as, a new crew will be aboard. Until then, CUL 73.

Greg KB7WFO, Tucson AZ

1926. Re: DO-17 (DOVE decoding)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-19 21:10:26 UTC
From: gregm50685@aol.com
Message-ID: <3alpk2$ne4@newsbf01.news.aol.com>
Source record: 26334

In article <miles-191194131008@slip-1-5.ots.utexas.edu>,
miles@mail.utexas.edu (Miles Abernathy) writes:

Miles, you might check with your local AMSAT group, I know there is one
around, I dont know of anyone using it here. Check on the HAM BBS!
73, Greg KB7WFO

1927. ARLK051 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-11-19 21:21:57 UTC
From: w1aw@arrl.org
Message-ID: <$arlk051.1994@ampr.org>
Source record: 26328
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK051
ARLK051 Keplerian data

ZCZC SK19
QST de W1AW
Keplerian Bulletin 51 ARLK051
From ARRL Headquarters
Newington, CT November 19, 1994
To all radio amateurs

SB KEP ARL ARLK051
ARLK051 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94311.32676368 -.00000015 00000-0 10000-3 0 3265
2 14129 26.7622 299.3734 6026132 225.3511 66.0715 2.05879904 57764
RS-10/11
1 18129U 87054A 94318.18981474 .00000051 00000-0 39091-4 0 9905
2 18129 82.9263 217.9628 0011636 336.1986 23.8621 13.72344408370481
UO-11
1 14781U 84021B 94315.06052587 .00000228 00000-0 46521-4 0 7522
2 14781 97.7831 322.8939 0011920 154.9578 205.2206 14.69268859571879
RS-12/13
1 21089U 91007A 94314.89481073 .00000034 00000-0 20010-4 0 7529
2 21089 82.9224 262.6390 0030774 61.3125 299.1109 13.74049624188790
AO-13
1 19216U 88051B 94311.77313192 -.00000578 00000-0 10000-4 0 9943
2 19216 57.6728 221.5174 7242728 354.2960 0.7033 2.09727084 17526
UO-14
1 20437U 90005B 94314.75728369 .00000048 00000-0 35720-4 0 510
2 20437 98.5840 37.4943 0011709 117.9863 242.2506 14.29862850250536
AO-16
1 20439U 90005D 94314.73734702 .00000060 00000-0 40131-4 0 8499
2 20439 98.5933 38.8702 0011886 118.6174 241.6195 14.29917035250542
DO-17
1 20440U 90005E 94314.74733392 .00000068 00000-0 43146-4 0 8505
2 20440 98.5946 39.2561 0011971 117.6647 242.5747 14.30057331250566
```

```
WO-18
1 20441U 90005F 94314.72533759 .00000058 00000-0 39226-4 0 8535
2 20441 98.5911 39.2212 0012660 118.6598 241.5856 14.30030481250561
LO-19
1 20442U 90005G 94314.76352360 .00000063 00000-0 41289-4 0 8490
2 20442 98.5953 39.5568 0012905 117.8080 242.4412 14.30128889250584
FO-20
1 20480U 90013C 94314.86950605 -.00000026 00000-0 15376-4 0 7462
2 20480 99.0603 79.1310 0541159 7.3799 353.4870 12.83227667222947
AO-21
1 21087U 91006A 94314.63738243 .00000094 00000-0 82657-4 0 5374
2 21087 82.9447 34.3286 0036504 37.3516 323.0164 13.74546529189703
UO-22
1 21575U 91050B 94314.64373750 .00000090 00000-0 44941-4 0 5554
2 21575 98.4225 26.0813 0007006 209.9760 150.1028 14.36942303174114
KO-23
1 22077U 92052B 94314.48928106 -.00000037 00000-0 10000-3 0 4489
2 22077 66.0854 333.6667 0015089 253.1319 106.8046 12.86288768105603
KO-25
1 22830U 93061H 94314.73346386 .00000053 00000-0 38592-4 0 3549
2 22830 98.5402 24.7130 0012212 105.0343 255.2191 14.28071024 58610
IO-26
1 22826U 93061D 94315.17647410 .00000057 00000-0 40848-4 0 3456
2 22826 98.6411 29.4736 0009520 136.0688 224.1250 14.27747026 58661
AO-27
1 22825U 93061C 94315.13616338 .00000026 00000-0 28461-4 0 3471
2 22825 98.6390 29.3717 0008942 134.8163 225.3740 14.27640897 58659
PO-28
1 22829U 93061G 94315.16126471 .00000069 00000-0 45313-4 0 3395
2 22829 98.6387 29.5026 0010504 123.3143 236.9055 14.28049996 58675
Mir
1 16609U 86017A 94317.55489449 .00004634 00000-0 67508-4 0 8431
2 16609 51.6468 158.7058 0001138 259.1348 100.9514 15.57867497499295

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
November 22, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

1928. HUBBLE PICTURES FROM SPACE?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 01:26:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.364.2922@freddy.supernet.ab.ca>
Source record: 26336

Hi Tyler,
I don't have the info you are looking for, but there is a sorce
that you can check with to get more info.

Marshall Space Centre BBS (205) 895-0028

Note: this BBS is slow in operations running 9600 baud only.

Please let me know how you made out. Thanks

Ernie Koch VE6LU
(ernie.koch@freddy.supernet.ab.ca)

1929. AO-27 Information??

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 01:41:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <50.365.2922@freddy.supernet.ab.ca>
Source record: 26330

Hi Erik,
AO-27 is only active on the weekend and only if the control
station turns it on! (They are very forgetful)
AO-27 operating notes; uplink 145.850 Mhz (low power only
please)
; downlink 436.800 Mhz (when the bird
first comes into view, the downlink frequency will be upto 10kcs higher
so check you frqeuency. This is very important on low orbit birds were
the dopler shift is large
; the satellite will only work if it is in
sunlight (solar power) and if on high power will have about 1 watt
output from the transponder. Low power about 1/2 watt.

Other notes: this bird is only on over Europe and North America or so
I'm told.

Good Luck and maybe you'll catch one of us VE's over the pole.

73 de Ernie VE6LU
(ernie.koch@freddy.supernet.ab.ca)

1930. Re: Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 10:10:52 UTC
From: mklee@actrix.gen.nz
Message-ID: <CzK9M4.IK5@actrix.gen.nz>
Source record: 26329

In article <dwetzel.7.00118F14@rain.com>, dwetzel@rain.com (Doug Wetzel) says:
>
>Anybody know of an ftp site that keeps current satellite kep info for all 200
>or so of the commonly tracked objects?
>
>Thanks!
>
>

Try archive.afit.af.mil at directory /pub/space.

Regards

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

1931. Re: DO-17 (DOVE decoding)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 13:40:08 UTC
From: wallio@dsm1.dsmnet.com
Message-ID: <3anjjo$hdh@dsm6.dsmnet.com>
Source record: 26332

In article <miles-191194131008@slip-1-5.ots.utexas.edu>, miles@mail.utexas.edu (Miles Abernathy) writes:
>> I'm looking for a P.C. program to decode the Dove telemetry. My
>> daughter is doing a science project on satellites and this
>> seems like the perfect addition to her study, ie. the tracking
>> and decoding of satellite telemetry.
>>
>> Anyone know of an "ftp" site where I can get a decoding program
>> (with instructions)?
>
>And how about a Macintosh version? Thank you!
>
>= =
> _ Miles Abernathy, N5KOB = I have a spelling checker.
> | |__ miles@mail.utexas.edu = It came with my PC.
>_| | POB 7580, Austin TX 78713 = It plane lee Marx four my review
>\ * / University of Texas @ Austin = Miss steaks aye kin knot sea.
> \/ tel. (512) 471-6521 U.S.A. = (from mini-JIR)
>= =

Miles and daughter,

Great thought! I have not heard of a Macintosh version but that means little. An MS-DOS decoder is available via FTP from:

pilot.njin.net
/pub/SpaceNews/software
duvdec10.zip

FTP the index (00_index) for the list of much more of interest.

All of the above is available to us through the efforts of
John Magliancane, KD2BD, of Brookdale Community College in New Jersey.

Regards, Ralph W0RPK

Ralph Wallio, W0RPK Indianola High School Theatres
1250 Highway G-24 Middle River Valley Radio Observatory
Indianola, Iowa 50125 High Altitude Balloon Experiments in Technology
Phone: 515-961-0383/6406
I'net: wallio@dsmnet.com IHS - MRVRO - HABET
PBBS : W0RPK@W0AK.IA.USA Multi-discipline Hands-on Education

1932. Re: DSP-93

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 16:27:26 UTC
From: rparsons@bga.com
Message-ID: <rparsons-2011941027260001@slip167.bga.com>
Source record: 26335

In article <3aj745$1lb@apple.com>, kchen@apple.com (Kok Chen) wrote:

> I called TAPR earlier this week and was told that the next batch won't be
> available until March and they will accept an order until January.

That is correct. The first batch is set to be shipped RSN

> Could you tell me what the development tools (assemble, compiler, etc)
> are like? (I presume the DSP code is in RAM and I don't have to burn a new
> set of ROM each time?) And will I be able to get hold of the tools
> before the next batch of kits ship?

There is an assembler, programming interfaces, documentation and lots of
sample code. Contact TAPR about early release.

> Also, could you tell me if the DSP-93 can be run standalone (from a ROM)
> without using a PC, once the code is developed?

There are changes in process to allow code to be added to the ROM. Right
now it is RAM bnased.

Ron W5RKN

1933. Re: Antennas for Pacsat dwnlink.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 16:30:40 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov20.163040.3118@ke4zv.atl.ga.us>
Source record: 26337

In article <WK.94Nov16143740@muscle.frc.maf.govt.nz> wk@muscle.frc.maf.govt.nz (Wilbert Knol) writes:
>
>
>I am trying to get a mode jd microsat station up and running, playing
>around with a TAPR PSK kit, homebrew UHF-> 10 m converter, IC725, TNC2
>etc.
>
>Also, I am trying different antennas for the downlink. So far I have
>built and tried a Lindenblad and a GP. Not getting terribly good
>signals, I recently built an MRF66 masthead preamp which made a big
>difference.
>
>Anyway, on most passes I can get a solid lock if signals are over S3,
>and I start copying frames when signals get up to S4-S5. With signals
>below S5, the modem is locked on, and 3 segments of the level bar
>graph light up, indicating a noisy signal. As soon as signals get up
>to S5, only one or two segments light up brightly, and I can copy the
>frames. The threshold point seems to be fairly sharp.

What's the S meter read with no satellite signal? Sounds like your receiving setup has a high noise floor. A signal 12 db (two S units on a calibrated S meter) above the noise should be solid copy. Seems like that's what you're getting now, but that your noise floor is about S3. You might want to do some system noise figure and sensitivity measurements to find out where that excess 18 db of noise is originating. I'd suspect the downconverter. Are you using a proper post-mixer termination? How free of phase noise is the LO? Etc.

>As I am still in the process of improving the downlink performance, I
>was wondering if I need to go to directional, tracking antennas to
>solve the marginal copy. Do people here use omni antennas and get
>reliable results, or should I be able to get the present setup to work?

Omni antennas can work. Your system noise figure may not be optimized yet.

>My next step is to change the GP for the Lindenblad again (this time
>with the preamp), trading off early copy for better signals during the
>middle of the pass.

A well constructed Lindenblad will solve most of your fading problems since it offers circular polarization. Of course that's assuming it's built correctly. My first one was a disaster.

>Any hints regarding downlink antennas appreciated, will summarise if
>enough interest.

Tracked CP beams are best, no doubt about it, but the GP vertical
and the Lindenblad should both work better than you are reporting.
What filter width are you using in your receiver? A good 500 Hz
filter will boost the SNR quite a bit.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1934. Re: HUBBLE PICTURES FROM SPACE?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 16:32:53 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov20.163253.3194@ke4zv.atl.ga.us>
Source record: 26338

In article <94320.122258TJH112@psuvm.psu.edu> Tyler Harpster <TJH112@psuvm.psu.edu>
writes:
>I'm posing this question: We can easily see the weather satellite pictures on
>home computers with some receiving equipment. How tough is it to see the
>pictures Hubble sends back? Does it only take pictures when tasked to? I do
>not know for sure, but assume it is not in geosynchronous orbit and would have
>to be tracked. Any frequencies? tylerN3SPD

The signals go through the TDRS satellite relay system. They're at
microwave, broadband digital, and multiplexed with all the other
signals TDRS handles. There's not much chance an amateur can intercept
and decode them without fairly sophisticated equipment.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1935. Re: Are there stars between the galaxies?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 16:53:06 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov20.165306.3384@ke4zv.atl.ga.us>
Source record: 26339
Body handling: HTML body converted to readable text

In article <3ah2ni$jio@newsbf01.news.aol.com> tomsunman@aol.com (TOM SUNMAN) writes:
>In article , dale.eason@stpaul.ncr.com
>(Dale Eason) writes:
>
> Dale,
> I do not believe there are any stars BETWEEN galaxies. It is
>believed that dark matter fills the void between the galaxies. What this
>dark matter is is not yet known. The edge of the galaxy is the point where
>there are no more stars or other galactic objects. Dark matter is believed
>to be why spirals do not "unwind". The matter keeps them help together.
>This dark matter is still a fairly not understood subject. Is was believed
>that the stars near the center of a galaxy orbited the center faster than
>the stars at the outer edge. We now know that they orbit at the SAME
>speed. At the speed they orbit the arms of spirals should unwind and fly
>off into space. They don't! So dark matter is believed to be why,
>"Pushing" against the galaxies preventing them from unwinding.

Yes, there are stars between galaxies, not many, but some (It's assumed
they are runaways from a galaxy since the intergalactic medium is assumed
to be thin enough to prevent star formation there). There is no sharply
defined galactic edge in the sense of a line beyond which we can say,
galaxy this side, inter-galactic space this side. The drop in number of
stars on the Rim is more gradual than that, but still sharp enough that
seen from the vantage of another galaxy, galaxies have definite form.

The Dark Matter hypothesis is still just a hypothesis, and it doesn't
work the way Tom suggests in any event. Dark Matter is not just ordinary
matter in too small a concentration to gather under gavitational influence
and light off nuclear fires to become stars. Dark Matter is posited to
be some, as yet unknown, form of matter that has practically no interaction
with other more mundane matter, but that does have mass. This Dark Matter
has to be uniformly distributed *inside* a galaxy in order to explain
the rigid disc-like motion of galaxy rotation. It's not something pushing
in from the outside. "Where's the missing mass?" is the pressing question
in cosmology and subnuclear physics. There have been many proposed answers,
ranging from quantum black holes to a neutrino "gas". But no one knows
for sure what Dark Matter, if it exists, is. It may turn out that there
is no Dark Matter, and that the answer lies in another direction entirely.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us

Lawrenceville, GA 30244 | |

1936. Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-20 21:29:08 UTC
From: rickmcm@delphi.com
Message-ID: <9411201627591.The_Win-D.rickmcm@delphi.com>
Source record: 26340

On yesterday's This Week In Amateur Radio program, N9LTD, who does the Easy Sat's segment was talking about receiving the weather satellites. I have been interested in doing this, and have an Icom R-7000 receiver that I have used to listen to them with.

I have not wanted to spend the money for the demodulator card for my PC. On yesterday's program, N9LTD mentioned receiving the satellites and putting the audio into a sound blaster card. He mentioned that there was a shareware program that would convert the sound file to an image.

This sounds great to me. Does anyone know what the name of the shareware file is, and where I can get it?

73, Rick, WB7UGZ

1937. Re: DO-17 (DOVE decoding)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 01:03:19 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <9411210103190028@g0oanint.demon.co.uk>
Source record: 26351

In article <miles-191194131008@slip-1-5.ots.utexas.edu>, Miles
Abernathy writes:

>
> > I'm looking for a P.C. program to decode the Dove telemetry. My
> > daughter is doing a science project on satellites and this
> > seems like the perfect addition to her study, ie. the tracking
> > and decoding of satellite telemetry.
> >
> > Anyone know of an "ftp" site where I can get a decoding program
> > (with instructions)?
>
> And how about a Macintosh version? Thank you!
>
You'll find the Mac version at

ftp.demon.co.uk /pub/ham/mac

It's called EZ Dove.sit. If you're interested there are a lot of other
amateur radio programmes in there including several Sat Tracking.

Regards,

Sean.

1938. Re: Antennas for Pacsat dwnlink.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 05:56:24 UTC
From: wk@muscle.frc.maf.govt.nz
Message-ID: <WK.94Nov21185624@muscle.frc.maf.govt.nz>
Source record: 26341

Thanks to KE4ZV for the comments. As Gary's was the only reply the is not much point in summarising.

Gary wrote:

> What's the S meter read with no satellite signal? Sounds like your
> receiving setup has a high noise floor. A signal 12 db (two S units
> on a calibrated S meter) above the noise should be solid copy. Seems
> like that's what you're getting now, but that your noise floor is
> about S3. You might want to do some system noise figure and sensitivity
> measurements to find out where that excess 18 db of noise is originating.
> I'd suspect the downconverter. Are you using a proper post-mixer
> termination?
> How free of phase noise is the LO? Etc.

The noise floor lies at S0 and AO16 becomes readable at S3-S4 which is 18-24 dB over the noise. The down converter response is not entirely flat, as the sat band is 3 MHz wide, but I have staggered the two coupled tanks at the output of the converter to give me a similar noise floor from 27 MHz (=435 MHz) to 30 MHz (=438 MHz).

The converter uses a crystal controlled LO, not a PLL, and the phase noise should not be too bad. The crystal train design is from a German book called UHF Unterlage. The mixer is an SBL-1, both RF and LO ports are padded (2dB on the RF port, 3dB on the LO plus an additional 6 dB pad to get the LO level down to 7dBm).

The IF port uses a PI network to achieve a 50 ohm load at all frequencies present (ARRL handbook 1990 page 12-25 fig 34), followed by a dual gate FET with double tuned circuits in the output.

The IC725 receiver has a built in preamp, which I normally use as it gives a slight improvement in copy, and it brings the S meter to life.

As I mentioned before, I use an MRF966 mast mounted preamp (ARRL handbook) under the GP, then 15 m of RG58 which probably eats up most of the claimed 20 dB of preamp gain. The signal is beefed up in the shack by a 2 stage amplifier (2 x BFY96) with adjustable gain, then into the RF port of the SBL-1 via the 2 dB pad.

I have attempted to use cookbook receipe designs for the converter as I have no test and measurement gear for UHF other than a dummy load and a RF sniffer for amplitude measurements. Anyway, it is not unrealistic to have a problem in the downconverter, and I am going to borrow a commercial UHF rig with a 2SK97 front end and try that in place of the converter business...

> Omni antennas can work. Your system noise figure may not be optimized
> yet.

That is good to know, I don't have space for a steerable array.
The other thing could be the TAPR modem. I have gone through the
TAPR alignment procedure (which is excellent) with a scope, function
generator and a counter, and it all went according to the docs. The
modem copies itself in loopback mode OK, but there could be a slight
problem with the Costas loop resulting in degraded sensitivity, but I
am hesitant to touch it :-) The PLL locks on at S2, but I don't get
copy until the sigals get over S4, which is quite strong (18-24 dB
over the noise floor).

> A well constructed Lindenblad will solve most of your fading problems
> since it offers circular polarization. Of course that's assuming it's
> built correctly. My first one was a disaster.

Well I can report back on the Lindenblad: I tried it on a dozen passes
and it suffered just as badly from QSB as the GP. In fact, the
Lindenblad did not seem to give me the nice strong signals that I get
from the GP during low elevation passes and during overhead passes it
seemed to be just as bad as the GP with long fade-outs. I have gone
back to the GP and flagged away the overhead part of the pass, which
is only 20 percent of the time anyway.

Listened to AO16 today which passed at a max elevation of 40 degrees,
and got 10 minutes worth of pretty good signals using the GP. Yes the
Lindenblad is a constructional nightmare and when it is finished, it
looks like a bizarre wind mill, guaranteed to attract comments from
the neighbours :-)

> Tracked CP beams are best, no doubt about it, but the GP vertical
> and the Lindenblad should both work better than you are reporting.
> What filter width are you using in your receiver? A good 500 Hz
> filter will boost the SNR quite a bit.

I tried using my 250 Hz (-6dB) CW filter but the 1600 Hz carrier would
not fit through it. The IC725 has a regular CW mode, which I reckon
uses the LSB filter setup, as sensitivity and selectivity are
specified the same for both CW and SSB. It might be worth getting a
500 Hz CW filter but you would have to tune for a 1000 Hz carrier and
re-align the TAPR modem to work with that... I take it you have tried
receiving 1200 bps PSK through a 500 Hz passband?

Anyway, may next job is to try with the borrowed UHF rig to see if the
down converter is the problem...will keep you posted.

Wilbert, ZL2BSJ
--
Wilbert Knol, Acoustics Group, MAF Marine Research, Wellington, New Zealand.
Usenet: wk@frc.maf.govt.nz PACKET:ZL2BSJ@ZL2WA.NZL.OC
AMPR:[44.147.180.88] AX25 NET/ROM TCP/IP MBX 146.625 147.075 MHz 24 hrs.

1939. The Leonids are back !!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 06:14:02 UTC
From: jsi@vipunen.hut.fi
Message-ID: <3apdra$b83@nntp.hut.fi>
Source record: 26342

Leonid meteor shower peaked on last friday, Nov 18 at 07 UT. According to OH5IY's recordings at 87 MHz the peak was slightly better than the Perseids' peak this year ! The Leonids are showing increased activity much earlier than expected ! Visual observations as well as meteor scatter experiences by a number of amateurs confirm the increased activity.

The Leonids have a 33 year period and they have been expected to peak for storm-level activity in 1998 or 1999. The previous peak in 1966 yielded about 60 000 meteors per hour, for 40 minutes ! Well, sure looks promising for 1998 or 1999 !

For those interested in hot data, Leonid 1994 data file for OH5IY's MSSOFT (v4.2f) is available at ftp.funet.fi:/pub/ham/vhf-work/msdata94.zip

Jukka, OH6DD

--
Jukka Sirvio jsi@hut.fi

1940. Re: DSP-93

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 09:24:59 UTC
From: gjones@tcet.unt.edu
Message-ID: <3app1c$37k@hermes.unt.edu>
Source record: 26343

Kok Chen (kchen@apple.com) wrote:
: rparsons@bga.com (Ronald G. Parsons) writes:

: >I have been beta testing the DSP-93 for several months. I have used it on
: >9600 bps satellites and 1200 bps terrestrial packet. Others in the group
: >have used it with the PSK birds and HF "packet".

: I called TAPR earlier this week and was told that the next batch won't be
: available until March and they will accept an order until January.

Yep - them are the breaks....but glad you made the order. We have 60 or
so of the 150 slots filled for the March production. Taking order until
Jan 1st or so.

The big problem here is that it only makes sense for us (TAPR) to do
kits of this cost in larger runs....the hassel of getting parts in small
qtys for a continuous run and or putting all our cash assets in a kit
production so that we can't continue to work on other things just isn't
possible with the cost of the units.

: I ordered it sight unseen, and asked for the brouchures to be sent
: *after* I made the order :-).

Great! I think you will like it.
The enclosure came out looking really nice!

: Could you tell me what the development tools (assemble, compiler, etc)
: are like? (I presume the DSP code is in RAM and I don't have to burn a new
: set of ROM each time?) And will I be able to get hold of the tools
: before the next batch of kits ship?

: Also, could you tell me if the DSP-93 can be run standalone (from a ROM)
: without using a PC, once the code is developed?

Yes to all.

The newest MONITOR code has the ability to load programs stored in EPROM
for operations. The main reason here is for automated users.

TASM 3.0 is what we are using. A Table driven system. Although Ron and
Bill Beech have commented off and on on doing something for the DSP-93.

You can load obj files into the unit by three methods, at the DOS
prompt, using a Windows development system, or the Mac development
system. The win and mac system support a spec analyze, scope and
probably more instruments as they are developed.

They surprised me at the AMSAT meeting with the working scope program in the windows program -- always like little surprises like that :-)

: My objective is the best HF modem one can build for RTTY :-). I used
: to do DSP even before the days it was called DSP (certainly before Parks
: published his Remez-exchange program) and it would be fun to play with
: that stuff again. Have been into graphics algorithms lately.

This sounds like you need to be in on the TAPR HF SIG. They are working on improving HF digital communications. Send a message to listserv@tapr.org and in the message body say 'get tapr taprinfo.txt'

This file will tell you all about the SIGs and how to join and get more information.

They are spending a lot of time right now on simulators.

Sorry about the big gaps in production runs, but hopefully with all the interest in the unit and the great software development happening before and I figure after the first production, it should be a matter of time before folks want to OEM the design and produce it commerically.

Cheers - greg

P.S. For those waiting - if you don't make the March Production, the next one will probably be August/Sept 1995.

President -- Tucson Amateur Packet Radio Corp

TAPR Office (817) 383-0000 | Internet: gjones@tenet.edu

1941. Re: DO-17 (DOVE decoding)

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 14:02:35 UTC
From: "Richard B. Langley" <lang@unb.ca>
Message-ID: <3aq99r$sc9@sol.sun.csd.unb.ca>
Source record: 26344

In article <3anjjo$hdh@dsm6.dsmnet.com> Ralph Wallio, wallio@dsm1.dsmnet.com
writes:
> In article <miles-191194131008@slip-1-5.ots.utexas.edu>,
miles@mail.utexas.edu
> (Miles Abernathy) writes:
> >> I'm looking for a P.C. program to decode the Dove telemetry. My
> >> daughter is doing a science project on satellites and this
> >> seems like the perfect addition to her study, ie. the tracking
> >> and decoding of satellite telemetry.
> >>
> >> Anyone know of an "ftp" site where I can get a decoding program
> >> (with instructions)?
> > >
> > >And how about a Macintosh version? Thank you!
> > >
> > >= =
> > > _ Miles Abernathy, N5KOB = I have a spelling checker.
> > > | |__ miles@mail.utexas.edu = It came with my PC.
> > >_| | POB 7580, Austin TX 78713 = It plane lee Marx four my review
> > >\ * / University of Texas @ Austin = Miss steaks aye kin knot sea.
> > > \/ tel. (512) 471-6521 U.S.A. = (from mini-JIR)
> > >= =
>
> Miles and daughter,
>
> Great thought! I have not heard of a Macintosh version but that means
> little. An MS-DOS decoder is available via FTP from:
>
> pilot.njin.net
> /pub/SpaceNews/software
> duvdec10.zip
>
> FTP the index (00_index) for the list of much more of interest.
>
> All of the above is available to us through the efforts of
> John Magliancane, KD2BD, of Brookdale Community College in New Jersey.
>
> Regards, Ralph W0RPK
>
> ---
> Ralph Wallio, W0RPK Indianola High School Theatres
> 1250 Highway G-24 Middle River Valley Radio Observatory
> Indianola, Iowa 50125 High Altitude Balloon Experiments in Technology
> Phone: 515-961-0383/6406

> I'net: wallio@dsmnet.com IHS - MRVRO - HABET
> PBBS : W0RPK@W0AK.IA.USA Multi-discipline Hands-on Education
> --

Look for MacDOVE in the various ham archives. If you can't find it, e-mail me
and I'll send you the Binhexed program via return e-mail.
-- Richard Langley

==
Richard B. Langley Internet: LANG@UNB.CA or SE@UNB.CA
Geodetic Research Laboratory BITnet: LANG@UNB or SE@UNB
Dept. of Geodesy and Geomatics Engineering Phone: (506) 453-5142
University of New Brunswick FAX: (506) 453-4943
Fredericton, N.B., Canada E3B 5A3 Telex: 014-46202
==

1942. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 15:47:34 UTC
From: boyer@rd.bbc.co.uk
Message-ID: <CzMJvB.2sG@bbc.co.uk>
Source record: 26345

Rick McMillion (rickmcm@delphi.com) wrote:

: On yesterday's This Week In Amateur Radio program, N9LTD, who
: does the Easy Sat's segment was talking about receiving the
: weather satellites. I have been interested in doing this,
: and have an Icom R-7000 receiver that I have used to listen
: to them with.

: I have not wanted to spend the money for the demodulator card
: for my PC. On yesterday's program, N9LTD mentioned receiving
: the satellites and putting the audio into a sound blaster card.
: He mentioned that there was a shareware program that would
: convert the sound file to an image.

: This sounds great to me. Does anyone know what the name of the
: shareware file is, and where I can get it?

: 73, Rick, WB7UGZ

Yes, the program is called sbdsp. It works quite well. A bit trick to work out the numbers initially, but not bad.
However It samples at 9600hz and for a 8 minute pass you get a 4.6MB file. Then you run this through sbdsp and get another 4.6Mb file. This second file is raw data and must be loaded into something like imdisp or the image machine or winlab. I recommend winlab it's quicker than the image machine and Imdisp is harder to drive.

You should note that the fm bandwidth of the wefax signal is around 38kHz and that your whites will be very badly crushed, but well worth having a go. If you need any further help the mail me.

John B
john.boyer@rd.eng.bbc.co.uk

1943. Test

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 16:04:02 UTC
From: facstaff.wisc.edu
Message-ID: <3aqgdi$f1e@news.doit.wisc.edu>
Source record: 26346

This is just a test.

1944. Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 18:49:21 UTC
From: rr03@nyssa.swt.edu
Message-ID: <3aqq3h$rp@central.server.swt.edu>
Source record: 26347

I had the pleasure of watching MIR course across the morning sky today. I also listened to it on a scanner. Rather often, a short burst of packet noise broke through the static. There were at least 10 of these bursts over a 2 or 3 minute period. Each burst lasted a second or less. Not having any sort of a packet translator, I'm curious as to what was being broadcast from MIR. Can anyone help?

I've been hearing these packet bursts on most passes that I've been able to monitor over the past two weeks. It appears that ever since the last crew of three, including the ESA astronaut, returned to earth around November 4, MIR has been making packet noises.

Ryan Rudnicki
rr03@academia.swt.edu

1945. OrbiTrack Documentation?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 19:03:42 UTC
From: rick_whiting@atk.com
Message-ID: <1994Nov21.190342.10534@omega.atk.com>
Source record: 26348

I ran across the satellite tracking program OrbiTrack (for Mac) at an ftp site recently. However, there was no documantation. Does anybody know where the documentation might be found?

By the way, any better satellite program for the Mac SE/Sys. 6 user?

73/Rick W0TN <rick_whiting@atk.com>

| Rick Whiting Office Phone 612-931-5344 |
| 5780 Rosewood Lane N. Home Phone 612-550-1213 |
| Plymouth, MN 55442 Fax 612-931-5735 |
| U.S.A. E-mail rick_whiting@atk.com |
| Packet W0TN @ WB0GDB.MN.USA.NOAM |

1946. OrbiTrack Documentation?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 19:14:39 UTC
From: rick_whiting@atk.com
Message-ID: <1994Nov21.191439.10771@omega.atk.com>
Source record: 26349

I ran across the satellite tracking program OrbiTrack (for Mac) at an ftp site recently. However, there was no documantation. Does anyone know where the documentation might be found?

By the way, any better satellite program for the Mac SE/Sys. 6 user?

73/Rick W0TN <rick_whiting@atk.com>

| Rick Whiting Office Phone 612-931-5344 |
| 5780 Rosewood Lane N. Home Phone 612-550-1213 |
| Plymouth, MN 55442 Fax 612-931-5735 |
| U.S.A. E-mail rick_whiting@atk.com |
| Packet W0TN @ WB0GDB.MN.USA.NOAM |

1947. Re: Antennas for Pacsat dwnlink.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-21 19:28:32 UTC
From: gary@ke4zv.atl.ga.us
Message-ID: <1994Nov21.192832.9019@ke4zv.atl.ga.us>
Source record: 26350

In article <WK.94Nov21185624@muscle.frc.maf.govt.nz> wk@muscle.frc.maf.govt.nz (Wilbert Knol) writes:
>The noise floor lies at S0 and AO16 becomes readable at S3-S4 which is
>18-24 dB over the noise. The down converter response is not entirely
>flat, as the sat band is 3 MHz wide, but I have staggered the two
>coupled tanks at the output of the converter to give me a similar
>noise floor from 27 MHz (=435 MHz) to 30 MHz (=438 MHz).
>
>The converter uses a crystal controlled LO, not a PLL, and the phase
>noise should not be too bad. The crystal train design is from a German
>book called UHF Unterlage. The mixer is an SBL-1, both RF and LO
>ports are padded (2dB on the RF port, 3dB on the LO plus an additional
>6 dB pad to get the LO level down to 7dBm).
>
>The IF port uses a PI network to achieve a 50 ohm load at all
>frequencies present (ARRL handbook 1990 page 12-25 fig 34), followed
>by a dual gate FET with double tuned circuits in the output.

Ok, your design sounds good, and if you really do have 24 db over the noise (most S Meters lie) the modem should be working like gangbusters. I'm not the best one to be telling you how to optimize system noise figure, Zack Lau is much better qualified, but I'll give you a simple test to try. See if your noise floor drops slightly when you replace the antenna with a dummy load. At 2 meters, a good system should be slightly quieter than atmospheric noise. If so, you'd be wasting your time trying to get it better.

>The IC725 receiver has a built in preamp, which I normally use as it
>gives a slight improvement in copy, and it brings the S meter to life.
>
>As I mentioned before, I use an MRF966 mast mounted preamp (ARRL
>handbook) under the GP, then 15 m of RG58 which probably eats up most
>of the claimed 20 dB of preamp gain. The signal is beefed up in the
>shack by a 2 stage amplifier (2 x BFY96) with adjustable gain, then into
>the RF port of the SBL-1 via the 2 dB pad.

Yucko! :-) Still if it passes the above test, it's good enough. I'd try to use better cable and lose the 2xBFY96's. They're mostly acting to degrade the noise figure in the current setup. You need enough gain at the mast top to overcome the cable loss and the mixer loss. The latter should be around 6 db for your setup, and you're probably losing in excess of 8 db in the RG-58. You don't want excess gain before the filter, that can lead to IMD problems.

>I have attempted to use cookbook receipe designs for the converter as
>I have no test and measurement gear for UHF other than a dummy load
>and a RF sniffer for amplitude measurements. Anyway, it is not
>unrealistic to have a problem in the downconverter, and I am going to
>borrow a commercial UHF rig with a 2SK97 front end and try that in
>place of the converter business...

A pulsed noise source, circuit in the Handbook, is the tool you need
to tweak system noise figure. Remember tweak for best noise figure,
not best gain. They are often rather radically different. Input tuning
is the critical parameter for preamps.

>> Omni antennas can work. Your system noise figure may not be optimized
>> yet.
>
>That is good to know, I don't have space for a steerable array.
>The other thing could be the TAPR modem. I have gone through the
>TAPR alignment procedure (which is excellent) with a scope, function
>generator and a counter, and it all went according to the docs. The
>modem copies itself in loopback mode OK, but there could be a slight
>problem with the Costas loop resulting in degraded sensitivity, but I
>am hesitant to touch it :-) The PLL locks on at S2, but I don't get
>copy until the sigals get over S4, which is quite strong (18-24 dB
>over the noise floor).

Ah, well, the problem could be here, or in the radio. If you're getting
a signal from the radio with phase distortion, that could explain the
problem, or, as you suggest, you may have a modem problem. If you can
borrow the scope again, look at the received eye pattern. Look for
tilt on the rails, or distortion of the eye at bit center. Both are
indications of phase distortion. Also watch the clock jitter, if it's
high but the eye looks clean, it may indicate a PLL problem.

>> A well constructed Lindenblad will solve most of your fading problems
>> since it offers circular polarization. Of course that's assuming it's
>> built correctly. My first one was a disaster.
>
>Well I can report back on the Lindenblad: I tried it on a dozen passes
>and it suffered just as badly from QSB as the GP. In fact, the
>Lindenblad did not seem to give me the nice strong signals that I get
>from the GP during low elevation passes and during overhead passes it
>seemed to be just as bad as the GP with long fade-outs. I have gone
>back to the GP and flagged away the overhead part of the pass, which
>is only 20 percent of the time anyway.

Uh, oh, sounds like my first attempt. Double check the phasing harness,
you've got one turned anti-phase, that's why you're getting all the
nulls on the Lindenblad.

>Listened to AO16 today which passed at a max elevation of 40 degrees,
>and got 10 minutes worth of pretty good signals using the GP. Yes the
>Lindenblad is a constructional nightmare and when it is finished, it
>looks like a bizarre wind mill, guaranteed to attract comments from

>the neighbours :-)

Yep, it's ugly all right. Say, if you can tape record the satellite pass, it'll give you a signal source for tweaking the modem.

>> Tracked CP beams are best, no doubt about it, but the GP vertical
>> and the Lindenblad should both work better than you are reporting.
>> What filter width are you using in your receiver? A good 500 Hz
>> filter will boost the SNR quite a bit.
>
>I tried using my 250 Hz (-6dB) CW filter but the 1600 Hz carrier would
>not fit through it. The IC725 has a regular CW mode, which I reckon
>uses the LSB filter setup, as sensitivity and selectivity are
>specified the same for both CW and SSB. It might be worth getting a
>500 Hz CW filter but you would have to tune for a 1000 Hz carrier and
>re-align the TAPR modem to work with that... I take it you have tried
>receiving 1200 bps PSK through a 500 Hz passband?

Um, no. That gem of wisdom applies to the 400 bps telemetry beacons. The math says you need a bandwidth of 1.9 kHz for 1200 baud PSK (to the first nulls), but the math is a little conservative. Sorry to have led you astray with that comment, you'll need to use the SSB filter, and try to center the signal in it's passband. If you don't have IF shift, and I don't think the 725 does, you may need to retune the modem anyway to center the signal somewhere around 1250-1300 Hz to avoid asymmetrically chopping the signal. Look at the eye first, that will tell you. If you see compression at top or bottom, you're not centered well enough in the filter.

>Anyway, may next job is to try with the borrowed UHF rig to see if the
>down converter is the problem...will keep you posted.

Ok, but I'm beginning to suspect that isn't your problem.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | emory!kd4nc!ke4zv!gary
534 Shannon Way | Guaranteed! | gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244 | |

1948. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-22 03:16:43 UTC
From: ollie@netcom.com
Message-ID: <ollieCznFrw.M1s@netcom.com>
Source record: 26352

sbdsp sounds like a nice program. Does anyone know where
it's located? I'd like to ftp a copy.

--

Ollie Eisman (408) 461-9622 ollie@netcom.com
Santa Cruz, CA

1949. Re: Proper way to call Mir / Shuttle help needed

Newsgroup: rec.radio.amateur.space
Date: 1994-11-22 05:57:28 UTC
From: gerry@cs.tamu.edu
Message-ID: <3as188$ivh@news.tamu.edu>
Source record: 26355

Tom,

Congratulations on the new license. Let me see if I might help a little here...

In article <39p7qo$gip@newsbf01.news.aol.com>,
TOM SUNMAN <tomsunman@aol.com> wrote:
> Hello. I'm a new ham and I'm VERY interested in trying to contact
>Mir and the shuttle (when sarex is used of coarse!).
>My question is, what is the PROPER procedure for calling these craft? Is
>it a regular call (their callsign then "this is" my callsign)? Maybe
>"shuttle atlantis" (or whichever) "this is my callsign"? I want to make
>sure I do it properly.

For Mir, I usually call them in a normal fashion (to some extent) I've seen Musa Manarov, and Sergei Krikalov, use a slightly different approach. Both work, but the Russians get a slightly better response most of the time!

For Mir, I have been using the callsign known, or thought, to be current, say, R0MIR this is N5JXS, OVER. Use good practice, fairly short calls, and if you try to use phonetics, use the international (ICAO) phonetics, rather than something that sounds "catchy". Those guys are not always real good linguists, and in a lot of cases, their English skills are limited to the aviation world, where ICAO phonetics are standard. If you speak Russian, even a little, that can improve your opprotunities...

For SAREX, I'd STRONGLY recommend giving your callsign only once per transmission, in ICAO phonetics. A number of the astronauts have been heard to say that they will only answer ICAO phonetics if things are busy. That's what THEY are used to, also. Also, if they are busy working a large group, don't make lengthy calls, or use the vehicle name, or any of the "tricks" we seem to have picked up working DX pile-ups. Part of their training is working HF pile-ups, and they get some ideas pretty quickly of what they do NOT like in operating habits... being the subject of a pileup, they can choose who they'll talk to, and do so!

> I have an HT and I understand they can work but I may need higher
>power and a better antenna to increase my chances. I know the uplink is
>145.550, I suppose I need to switch to the downlink after I make my call
>to hear their responce. What is the downlink frequency? Any help on
>getting me started on these contacts would be appreciated. My license
>should be here in about 5 weeks so I've got some time to learn what I need
>to know. Thanks!

Mir is on simplex, on 145.55o MHz. If you happen to hear them somewhere else, they have a sked and are really doing something. Period. Similar tale for

SAREX. We do not have the scheduled school contacts on published frequencies. But, it's not too difficult to find someone if you know when they're gonna be talking, and have a scanner. If SAREX is heard, and is NOT on 145.55, they are busy, and not likely to want to talk to someone they weren't expecting!

The SAREX downlink for general QSOs is 145.55 MHz. The crew listen on any one of 5 uplinks: 144.91, 144.93, 144.95 (which is conveniently the standard offset of 600 khz), 144.97, or 144.99. It's suggested in training that, if they're on one uplink and things get too busy, just change, and DO NOT ANNOUNCE they're changing to another uplink. You'll still hear 'em on 145.55, just another group got a chance to talk, those on then newly selected uplink.

We did have one mission (STS-50) where, due to some problems, the crew elected to do ALL SAREX operations on one frequency pair: 145.55 down, 144.95 up. That was schools, general QSOs, everything. The crew (KB5SIW and KB5SIX) asked for consideration, and received it, whenever they had a scheduled contact. I'd hope it'd continue to happen.

If you've other questions, drop me a note.

73, Gerry

>73's
>
>Tom Randall
>

--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

1950. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-22 11:03:23 UTC
From: dt650@cleveland.Freenet.Edu
Message-ID: <3asj5r$blu@usenet.INS.CWRU.Edu>
Source record: 26353

In a previous article, rickmcm@delphi.com (Rick McMillion) says:

>
>On yesterday's This Week In Amateur Radio program, N9LTD, who
>does the Easy Sat's segment was talking about receiving the
>weather satellites. I have been interested in doing this,
>and have an Icom R-7000 receiver that I have used to listen
>to them with.
>
>I have not wanted to spend the money for the demodulator card
>for my PC. On yesterday's program, N9LTD mentioned receiving
>the satellites and putting the audio into a sound blaster card.
>He mentioned that there was a shareware program that would
>convert the sound file to an image.
>
>This sounds great to me. Does anyone know what the name of the
>shareware file is, and where I can get it?
>
>
>73, Rick, WB7UGZ

Rick,

Sorry, I should have given the file names on the program. Try these
files:

SBDSP.ZIP (37k) The original Soundblaster APT converter program for DOS.
Takes .VOC files produced by SoundBlaster (or
compatables) and converts them to a format that can
be read by _some_ viewers.

SBPW31.ZIP (59k) Windows version of above.

WLAB.ZIP (856k) Elaborate picture editing program that _should_ be able
to view the output file from SBDSP.ZIP.

DSPSHELL.ZIP (42k) Also converts SoundBlaster .VOC output to an image file.

WXMAN20.ZIP (264k) Hold your SoundBlaster microphone up to the speaker of
your HF rig and copy WEFAX pictures off the air.

I wish I could tell you that I've tested all the programs above and that
they work as advertised, but I haven't. Soon, I hope. Meanwhile, if you
want to try them, they're on the Clear Skies BBS in Madison, Wisconsin,
at (608) 249-7130 (14.4k). I hope to be trying them in the near future
and I'll let you know what I discover.

Dave, N9LTD
Please send any email to djmullen@facstaff.wisc.edu

1951. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-22 13:55:51 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3ast97$suc@news.doit.wisc.edu>
Source record: 26354

In a previous message, I recommended:

>SBPW31.ZIP (59k) Windows version of above. (SoundBlaster APT converter)

Sorry - this file was mislabeled on the BBS I found it on.
It's really a collection of SoundBlaster drivers. It has
nothing to do with APT or WEFAX.

Dave, N9LTD

1952. Re: DSP-93

Newsgroup: rec.radio.amateur.space
Date: 1994-11-22 22:33:31 UTC
From: rick_whiting@atk.com
Message-ID: <1994Nov22.223331.2807@omega.atk.com>
Source record: 26356

In article <3aj745$1lb@apple.com>
kchen@apple.com (Kok Chen) writes:

> Could you tell me what the development tools (assemble, compiler, etc)
> are like? (I presume the DSP code is in RAM and I don't have to burn a new
> set of ROM each time?) And will I be able to get hold of the tools
> before the next batch of kits ship?
>
> Also, could you tell me if the DSP-93 can be run standalone (from a ROM)
> without using a PC, once the code is developed?
>
> My objective is the best HF modem one can build for RTTY :-). I used
> to do DSP even before the days it was called DSP (certainly before Parks
> published his Remez-exchange program) and it would be fun to play with
> that stuff again. Have been into graphics algorithms lately.

A good source for info on the TAPR DSP-93 is the TAPR DSP-93 SIG for
those building the kit. To subscribe send e-mail to listserv@tapr.org
with the following command as the message text:

subscribe DSP-93 Kok Chen

You might also be interested in the TAPR HF and DSP SIG's. Send e-mail
to same address but with the following command as the text:

subscribe HFSIG Kok Chen

and another with text:

subscribe DSP Kok Chen

By the way, the work being led by Johan Forrer on the HF sig on modems
and channel simulation is outstanding.

73/Rick W0TN

| Rick Whiting Office Phone 612-931-5344 |
| 5780 Rosewood Lane N. Home Phone 612-550-1213 |
| Plymouth, MN 55442 Fax 612-931-5735 |
| U.S.A. E-mail rick_whiting@atk.com |
| Packet W0TN @ WB0GDB.MN.USA.NOAM |

1953. Re: Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 04:25:23 UTC
From: wdunckel1@aol.com
Message-ID: <3aug7j$36e@newsbf01.news.aol.com>
Source record: 26357

In article <3aqq3h$rp@central.server.swt.edu>, rr03@nyssa.swt.edu (Ryan Rudnicki) writes:

>Rather often, a short burst of packet
>noise broke through the static. There were at least 10 of these bursts over
>a 2 or 3 minute period. Each burst lasted a second or less. Not having
>any sort of a packet translator, I'm curious as to what was being broadcast
>from MIR. Can anyone help?
Packet is method used to send information over radio waves using a radio, computer,keyboard and Terminal Node Controler or TNC. The way Mir is most often used is sort of a message BBS. They will upload messages for their friends to download later from anywhere on the globe. Another common mode is to use Mir as a repeater. People can then use VHF to transmit over a thousand miles typing messages into the computer. Mir will also send out an ID message if all is quiet.
If your curious, just stop by a Ham radio shop and ask to see an operating packet setup. The Ham Radio Outlet near me has one setup. I must admit packet is sort of a world different than what I had expected.

1954. Hello.....

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 10:13:00 UTC
From: ken.snipes@woodybbs.com
Message-ID: <93.1955.7587.0NFB6468@woodybbs.com>
Source record: 26369

With this message....

The Listening Post BBS
Hampton, Va.
Becomes a new member of AR-Net

Hope to enjoy many good conversations with all of you!

Ken Snipes , KD4IEN
Sysop of The Listening Post BBS.

--- From Ken's PVT Point
* Origin: (1:271/263)

1955. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 12:23:17 UTC
From: Rolf Mathison <rolf_mathison@HPATC1.desk.hp.com>
Message-ID: <3avc7l$8dm@hpuerci.atl.hp.com>
Source record: 26361

dt650@cleveland.Freenet.Edu (David J. Mullenix) wrote:
>
>
> In a previous article, rickmcm@delphi.com (Rick McMillion) says:
>
> >
> >On yesterday's This Week In Amateur Radio program, N9LTD, who
> >does the Easy Sat's segment was talking about receiving the
> >weather satellites. I have been interested in doing this,
> >and have an Icom R-7000 receiver that I have used to listen
> >to them with.
> >
> >I have not wanted to spend the money for the demodulator card
> >for my PC. On yesterday's program, N9LTD mentioned receiving
> >the satellites and putting the audio into a sound blaster card.
> >He mentioned that there was a shareware program that would
> >convert the sound file to an image.
> >
> >This sounds great to me. Does anyone know what the name of the
> >shareware file is, and where I can get it?
> >
> >
> >73, Rick, WB7UGZ
>
> Rick,
>
> Sorry, I should have given the file names on the program. Try these
> files:
>
>
> SBDSP.ZIP (37k) The original Soundblaster APT converter program for DOS.
> Takes .VOC files produced by SoundBlaster (or
> compatables) and converts them to a format that can
> be read by _some_ viewers.
>
> SBPW31.ZIP (59k) Windows version of above.
>
> WLAB.ZIP (856k) Elaborate picture editing program that _should_ be able
> to view the output file from SBDSP.ZIP.
>
> DSPSHELL.ZIP (42k) Also converts SoundBlaster .VOC output to an image file.
>
> WXMAN20.ZIP (264k) Hold your SoundBlaster microphone up to the speaker of
> your HF rig and copy WEFAX pictures off the air.

>
> I wish I could tell you that I've tested all the programs above and that
> they work as advertised, but I haven't. Soon, I hope. Meanwhile, if you
> want to try them, they're on the Clear Skies BBS in Madison, Wisconsin,
> at (608) 249-7130 (14.4k). I hope to be trying them in the near future
> and I'll let you know what I discover.
>
> Dave, N9LTD
> Please send any email to djmullen@facstaff.wisc.edu

I've used WXMAN20 and it works well, however the signal I used w waass
a U.S.C.G. HF retransmission not directly from the satellitte. I
think you might have a problem with the direct reception because of
the circular polarization and the bandwith of your receiver. But
give it a shot...Its an inexpensive way to get APT.

Regards,
Rolf Mathison
rolf_mathison@HPATC1.desk.hp.com

1956. Re: Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 12:56:10 UTC
From: dmb@abacus.demon.co.uk
Message-ID: <Czq19M.20B@abacus.demon.co.uk>
Source record: 26359

In article <dwetzel.7.00118F14@rain.com>, Doug Wetzel <dwetzel@rain.com> wrote:
>Anybody know of an ftp site that keeps current satellite kep info for all 200
>or so of the commonly tracked objects?
>
>Thanks!
>
>

Apparently keps are available from ftp://archive.afit.af.mil/pub/space
(129.92.1.66), although I haven't tried this personally.

73

David
--
David Byrne, Abacus Software, London, UK Tel: +44 (0)71 930 4884
Email: dmb@abacus.demon.co.uk Fax: +44 (0)71 839 7445
Here's a koan: If you have ice-cream I will give you some. If you have none,
I will take it away from you. (it's an ice-cream koan).

1957. NOAA Sat. Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 14:00:22 UTC
From: rossl40555@aol.com
Message-ID: <3avhtm$275@newsbf01.news.aol.com>
Source record: 26358

Does anyone know of a modification for the Bearcat 560 that would give it the proper i.f. from 35 to 50kHz for receiving APT signals? Secondly, does anyone have any experience with the hamtronics or vanguard receivers? I am trying to setup a sat. reception system for my elem. science classes despite budget restraints and other teachers who think I'm nuts. Any help is most welcome.

Ross
KD4ZAF

1958. QSL MIR? Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 16:21:23 UTC
From: asirene@v9001.ntu.ac.sg
Message-ID: <1994Nov24.002123.1@v9001.ntu.ac.sg>
Source record: 26365

Hi,

Can someone tell me how to go about getting a QSL
from the MIR? I managed to work itbut lost it while sending
a message because it went out of range. Does this qualify me
for a QSL? Who should I send anything to? Any information
would be appreciated. Thanks.

73 de 9V1ZV Daniel

1959. Re: OrbiTrack Documentation?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 21:32:08 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <9411232132080029@g0oanint.demon.co.uk>
Source record: 26362

In article <1994Nov21.191439.10771@omega.atk.com>, Rick Whiting
writes:

>
> I ran across the satellite tracking program OrbiTrack (for Mac) at
an
> ftp site recently. However, there was no documantation. Does
anyone
> know where the documentation might be found?
>
> By the way, any better satellite program for the Mac SE/Sys. 6
user?
>
> 73/Rick W0TN <rick_whiting@atk.com>
>
Hello Rick,

There is indeed documentation for OrbiTrack however you can only
get it by registering your copy, it is Shareware after all, well
worth the money IMHO.

As to another satellite programme for the Mac SE you might find
MacSat more to your liking. It's really a stripped down version
of OrbiTrack but might suit your needs better on the 9" B&W
screen. I'll try and upload it tonight so it should be available
within the next 48 hours or so.

If you need anymore info please let me know.

FTP site details,

ftp.demon.co.uk /pub/ham/mac

1960. Re: NOAA Sat. Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-23 22:03:29 UTC
From: dale@dsq950.com
Message-ID: <dale.1136015849F@news.ip.portal.com>
Source record: 26360

In Article <3avhtm$275@newsbf01.news.aol.com>, rossl40555@aol.com
(RossL40555) wrote:
>Does anyone know of a modification for the Bearcat 560 that would give it
>the proper i.f. from 35 to 50kHz for receiving APT signals? Secondly,
>does anyone have any experience with the hamtronics or vanguard receivers?
> I am trying to setup a sat. reception system for my elem. science classes
>despite budget restraints and other teachers who think I'm nuts. Any help
>is most welcome.
>
>Ross
>KD4ZAF

I have a Vanguard Wepix-2000 receiver that seems to function. However, it
had at least three cold solder joints in it that prevented the recovered
audio from coming out the connector on the back. You could hear it fine from
the internal speaker. Doesn't look like they do good (or any) QA before
shipping.
Dale Satterfield
ICON Medical Systems

1961. Re: Antennas for Pacsat dwnlink.

Newsgroup: rec.radio.amateur.space
Date: 1994-11-24 01:38:37 UTC
From: wk@muscle.frc.maf.govt.nz
Message-ID: <WK.94Nov24143837@muscle.frc.maf.govt.nz>
Source record: 26363

Wel, it looks like I have it sorted out. Following Garys comments regarding noise performance and gain distribution in my 70 cm -> 28 MHz down converter, I made a few changes:

The converter has been moved to the laundry, now only 10 m away from the GP. The 20 odd metres of RG58 now carries the 28 MHz IF to the shack, instead of 437 MHz. Also, I got my hands on some expensive looking 50 ohm coax (RG213 size, but double screened, core and braids silver coated, don't ask me what it is...) to connect the masthead preamp to the converter.

I dug out my old noise source and re-aligned the MRF966 masthead preamp with the GP connected, and the noise source coupled into the GP via a rubber duckie. Optimised for noise this time, not gain.

Anyway, to make a long story short, I logged a 58 deg. elevated pass of WO18 at S9 and copied endless streams of telemetry for up to 12 minutes. I can hit AO16 and LO19 whenever they are higher than 20 deg. With the converter out of the shack I have also eliminated a few birdies coming from the PC.

The two stage front and amplifier is still needed at the SBL-1 RF port. I had a discussion with Wayne ZL2BKC, a long time UHF/SHF nut, who reckons the masthead amp should be set up for a gain to make up xmission line losses to the converter plus 9dB SBL-1 conversion loss (includes 2 dB for the RF port pad) plus another 10 dB to lift the signal well clear off the SBL-1 noise floor. So, ignoring xmission line losses, a total front end gain of at least 19 dB is needed. The MRF966 is good for 20, so I guess that explains the need for the extra front end amp to compensate for xmission line and connector losses.

Having seen the light, I am now planning to combine MRF966 with the converter and put the whole lot up under the GP, running 28 MHz straight to the shack. Doing this, I shouldn't have to use that dodgy additional amp at the front end anymore, which should benefit the dynamic range.

Indeed the GP is able to comfortably pull in the signals of all but the highly elevated passes. Obviously I need a dipole or a quad loop for those steep passes. Am toying with the idea of putting a loop around the GP, a quarter wave above the radials which would be nice and compact, and maybe turn the GP into a 5/8th to increase low angle gain.

The uplink needs some work too... surprisingly the pacsats can hear my 5 watts FM PSK into a half wave vertical, parked in the corner of the

lounge. They must have pretty good receivers in them. Thanks are due
to KE4ZV and others for the useful, constructive comments.

Wilbert, ZL2BSJ.

--
Wilbert Knol, Acoustics Group, MAF Marine Research, Wellington, New Zealand.
Usenet: wk@frc.maf.govt.nz PACKET:ZL2BSJ@ZL2WA.NZL.OC
AMPR:[44.147.180.88] AX25 NET/ROM TCP/IP MBX 146.625 147.075 MHz 24 hrs.

1962. Re: Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-11-24 17:15:13 UTC
From: gregm50685@aol.com
Message-ID: <3b2hn1$mfi@newsbf01.news.aol.com>
Source record: 26364

In article <3aqq3h$rp@central.server.swt.edu>, rr03@nyssa.swt.edu (Ryan Rudnicki) writes:

Ryan- Its possible you are only hearing one side of a conversation. The other side could be in another state. Mir has a BBS on board that has just recently began operation after being offline for quite a while. Many messages are on it and, I have connected with it many times. Also, it will send out a message or QSO information as it passes around the world. A computer and amateur radio and TNC will decode the information. A typical pass lasts about 9 minutes. I have a large antenna that rotates and, a satellite track program to know where and when it will appear. hope this helps, 73, Greg KB7WFO Tucson AZ USA

1963. Re: OrbiTrack Documentation?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-24 19:24:00 UTC
From: hrsblackwell@hrs.gsfc.nasa.gov
Message-ID: <hrsblackwell-2411941424000001@n3kwu.gsfc.nasa.gov>
Source record: 26366

In article <941123213208000029@g0oanint.demon.co.uk>,
sean@g0oanint.demon.co.uk wrote:

In article <1994Nov21.191439.10771@omega.atk.com>, Rick Whiting
writes:

>
> I ran across the satellite tracking program OrbiTrack (for Mac) at
an
> ftp site recently. However, there was no documantation. Does
anyone
> know where the documentation might be found?
>
> By the way, any better satellite program for the Mac SE/Sys. 6
user?
>
> 73/Rick W0TN <rick_whiting@atk.com>
>
Hello Rick,

There is indeed documentation for OrbiTrack however you can only
get it by registering your copy, it is Shareware after all, well
worth the money IMHO.

As to another satellite programme for the Mac SE you might find
MacSat more to your liking. It's really a stripped down version
of OrbiTrack but might suit your needs better on the 9" B&W
screen. I'll try and upload it tonight so it should be available
within the next 48 hours or so.

If you need anymore info please let me know.

FTP site details,

ftp.demon.co.uk /pub/ham/mac

Rick,
I sent in my shareware fee at least a year ago and NEVER got any docs.
The check was cancelled though. I'd like to know what happened to
further development on what I think is still the best mac-based tracking
program out there.

My 2 cents worth

--
Jim Blackwell
GHRS Project

Computer Science Corporation
NASA/GSFC Code 681.0
Greenbelt, MD 20771

1964. Re: OrbiTrack Documentation?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-24 19:48:38 UTC
From: rparsons@bga.com
Message-ID: <rparsons-2411941348380001@slip247.bga.com>
Source record: 26367

In article <hrsblackwell-2411941424000001@n3kwu.gsfc.nasa.gov>,
hrsblackwell@hrs.gsfc.nasa.gov (James H. Blackwell Jr.) wrote:

> I sent in my shareware fee at least a year ago and NEVER got any docs.
> The check was cancelled though. I'd like to know what happened to
> further development on what I think is still the best mac-based tracking
> program out there.
>
> Jim Blackwell

I just received my 2.1.5 update diskette so the author is alive and
kicking. Suggest you cantact him.

Ron W5RKN

1965. Help (HRPT, AVHRR) !!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-24 20:21:12 UTC
From: spek@cse.ucsc.edu
Message-ID: <3b2sjo$pbp@darkstar.UCSC.EDU>
Source record: 26368

Hi,
I am interested in building a HRPT/AVHRR receiving station and
I was wondering if anyone could suggest equipment that I should
purchase and their respective prices. I dont have a specific
budget yet but I would like to buy some good reasonably priced
equipment.

-jas

PS. Please email me if possible.

1966. Re: Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-11-24 23:22:32 UTC
From: drted@ix.netcom.com
Message-ID: <3b377o$b7m@ixnews1.ix.netcom.com>
Source record: 26370

In <Czq19M.20B@abacus.demon.co.uk> dmb@abacus.demon.co.uk (David Byrne) writes:

>
>In article <dwetzel.7.00118F14@rain.com>, Doug Wetzel <dwetzel@rain.com> wrote:
>>Anybody know of an ftp site that keeps current satellite kep info for all 200
>>or so of the commonly tracked objects?
>>
>>Thanks!
>>
>>
>
>Apparently keps are available from ftp://archive.afit.af.mil/pub/space
>(129.92.1.66), although I haven't tried this personally.
>
>73
>
>David
>--
>David Byrne, Abacus Software, London, UK Tel: +44 (0)71 930 4884
>Email: dmb@abacus.demon.co.uk Fax: +44 (0)71 839 7445
>Here's a koan: If you have ice-cream I will give you some. If you have none,
> I will take it away from you. (it's an ice-cream koan).
>

This is correct. I use this site regularly to get the earliest available Shuttle keps. It might be one of the first commonly available sites for newly calculated keps data.
Bye... Ted..

1967. Re: Keps

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 01:55:14 UTC
From: tomsunman@aol.com
Message-ID: <3b3g62$rt8@newsbf01.news.aol.com>
Source record: 26371

In article <3b377o$b7m@ixnews1.ix.netcom.com>, drted@ix.netcom.com (Ted Viens) writes:

<This is correct. I use this site regularly to get the earliest
<available Shuttle keps. It might be one of the first commonly available
<sites for newly calculated keps data.
<Bye... Ted..

Yup and you can also ftp keps from Nasa Spacelink. Ftp to:

spacelink.msfc.nasa.gov /pub/Instructional Materials/Software/Tracking Elements/

The latest file was posted today. The file contains 2 line keps for a LOT of sats including Mir, HST, TDRS, etc. They work great with STSorbit plus. They are very accurate as well.

Tom

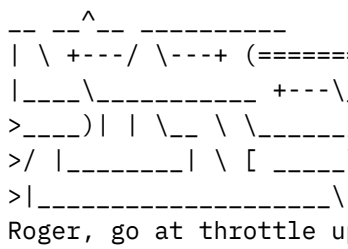
Tomsunman@aol.com Member: AAVSO Solar Division
Amateur radio: Pending "Ooh.....I wet 'em!" (Monty Python)
Warp? Not yet...Windoze? Yhea sure... Try out Geos 2.01!
Ftp to arginine.umdns.edu /pub/geos/publish and get all the files!
Also on America online in the Geoworks area!

1968. Re: OrbiTrack Documentation?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 07:20:00 UTC
From: Philip Chien <Pchien@ids.net>
Message-ID: <3b4370$2at@paperboy.ids.net>
Source record: 26372

In article <hrsblackwell-2411941424000001@n3kwu.gsfc.nasa.gov> James H. Blackwell Jr., hrsblackwell@hrs.gsfc.nasa.gov writes:
>There is indeed documentation for OrbiTrack however you can only
>get it by registering your copy, it is Shareware after all, well
>worth the money IMHO.
>
>Rick,
> I sent in my shareware fee at least a year ago and NEVER got any docs.
>The check was cancelled though. I'd like to know what happened to
>further development on what I think is still the best mac-based tracking
>program out there.

Bill Bard is indeed alive and kicking, I just met him at the AMSAT annual technical symposium a couple of months ago. His Compuserve E-mail account is 75366.2557@compuserve.com and I'd suggest sending him an E-mail if you haven't received the documentation or diskette.
Philip Chien, Earth News - space writer and consultant PCHIEN@IDS.NET



Roger, go at throttle up CHR$(32) the final frontier

1969. NASA Media Workshop

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 14:49:18 UTC
From: afn05824@freenet3.freenet.ufl.edu
Message-ID: <3b4the$l5d@freenet3.freenet.ufl.edu>
Source record: 26373

NOTE TO EDITORS: N94-82

JSC HOSTS MEDIA WORKSHOP FOR JOINT SHUTTLE/MIR MISSIONS

Astronauts, flight controllers and program managers will describe NASA's upcoming cooperative missions with Russia during a media workshop to be held at the Johnson Space Center (JSC) Dec. 14-16.

The three-day media workshop is designed to provide reporters with background information that will prepare them for the first joint missions between the U.S. and Russia and will focus specifically on the next flight, STS-63.

In February 1995, the crew of STS-63 will perform a rendezvous with and fly-around of the Russian Space Station Mir. STS-63 will set the stage for a flight in late May, when the Space Shuttle Atlantis will dock with the Mir for the first time. That mission, designated STS-71, will be the first of seven docking flights currently scheduled over the next three years.

"We are entering a new age in the space community," said Tommy Holloway, Phase One program manager and one of the workshop briefers. "In the past, our human space flight programs have generally been focused on one program and its supporting organizations. But now we are bringing together the space programs of two nations to accomplish an integrated mission that will strengthen both."

The first day of the workshop is designed to provide reporters with the framework for the cooperative missions. Briefings on joint flight control, orbital mechanics and the Mir station are among those scheduled. In the afternoon, tours of the new Consolidated Control Center and simulations of the Mir fly-around will be available.

-more-
-2-

The workshop's second day is devoted to the traditional pre-flight briefings for STS-63. The lead flight director, payload managers and crew members will discuss the mission's activities, goals and objectives.

The third day offers a look ahead to STS-71 and into the next century when multi-national cooperation in space will be

the backbone of the International Space Station.

The event will close with a presentation by NASA public affairs officials regarding coverage and media support for the joint missions. Briefers will discuss what provisions are being made for the media in the U.S. and Russia, and will explain what kind of television support will be available.

The tentative agenda for the workshop follows (All times are EST):

Wednesday, Dec. 14, 1994
9-10 a.m. -- Phase One Overview
10-11 a.m. -- Joint Flight Control and Training Overview
11-11:45 a.m. -- Orbiter Docking Equipment
11:45 a.m. - 1 p.m. -- Mir Familiarization
1-1:30 p.m. -- Orbital Mechanics and Rendezvous Basics

Afternoon -- Tours and Hands-On Activities*
Consolidated Control Center Tour
Proximity Operations Simulation

Thursday, Dec.15, 1994
9 - 10:30 a.m. -- STS-63 Mission Overview
10:30 - 11:30 a.m. -- Spacehab-3
11:30 - 12 noon -- Spartan-204
12 noon - 12:30 p.m. -- Secondary Payloads
2 - 4 p.m. -- STS-63 Crew News Conference
4 - 6 p.m. -- STS-63 Crew Round Robin Interviews*

Friday, Dec. 16, 1994
9 - 10 a.m. -- Early Look at STS-71
10 - 11 a.m. -- Looking Toward Space Station
11 - 1 p.m. -- How to Cover the Missions

All briefings (except those activities with *) will be carried live on NASA Television with two-way audio question-and-answer capability from other NASA Centers.

-more-
-3-

Reporters planning on attending the workshop at JSC should contact Kari Fluegel at (713) 483-5111 to ensure that adequate materials are available. Those wishing to participate in the round-robin interviews with the STS-63 crew members should contact Kyle Herring at (713) 483-5111 by Dec. 9.

NASA Television is available from GTE Spacenet 2, Transponder 5, Channel 9 at 69 degrees West Longitude. The transponder frequency is 3880 MHz and the audio subcarrier is

6.8 MHz. The polarization is horizontal.

-end-

NASA press releases and other information are available automatically by sending an Internet electronic mail message to domo@hq.nasa.gov. In the body of the message (not the subject line) users should type the words "subscribe press-release" (no quotes). The system will reply with a confirmation via E-mail of each subscription. A second automatic message will include additional information on the service. Questions should be directed to (202) 358-4043.

--

1970. New Dept. Head

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 14:53:08 UTC
From: afn05824@freenet3.freenet.ufl.edu
Message-ID: <3b4tok$11kf@freenet3.freenet.ufl.edu>
Source record: 26374

KRAFT TO HEAD INDEPENDENT SHUTTLE WORKFORCE REVIEW

Dr. Christopher C. Kraft, former Director of the Johnson Space Center, will form and lead an external independent team to review data from the Space Shuttle Functional Workforce Review and make recommendations to Administrator Daniel S. Goldin for implementation, Goldin announced today.

The Space Shuttle Functional Workforce Review was initiated in September 1994 to evaluate the resources and the requirements being expended on human space flight -- with program safety the first priority.

Kraft's team, which will be formed by the first week in December, is charged with evaluating the current process and procedures for conducting Space Shuttle operations at the Johnson, Kennedy, Marshall and Stennis Space Centers and related contractor activities with the intent of recommending a new and more optimum operating structure. Kraft's team also will provide recommendations on a plan to transition to any new organizational structure. Initial efforts will focus on Kennedy Space Center operations. As part of his charter, Kraft will review the management and contractual relationships for the operation of the Space Shuttle program.

Kraft's team will review related Space Station activities, as required, to ensure the necessary Space Shuttle Program support of the International Space Station.

The effort will be supported as required by NASA and reviews with the various NASA Centers and involved contractors will be an integral part of the effort. It is expected that Kraft's team will complete their work and make recommendations by March 15, 1995.

- end -

NASA press releases and other information areavailable automatically by sending an Internet electronic mail message to domo@hq.nasa.gov. In the body of the message (not the subject line) users should type the words "subscribe press-release" (no quotes). The system will reply with a confirmation via E-mail of each subscription. A second automatic message will include additional information on the service. Questions should be directed to (202) 358-4043.

--

1971. Re: Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 16:58:59 UTC
From: rr03@nyssa.swt.edu
Message-ID: <3b554j$5bl@central.server.swt.edu>
Source record: 26375

>In article <3b2hn1$mfi@newsbf01.news.aol.com>, gregm50685@aol.com (GregM50685)
>writes:
>
>computer and amateur radio and TNC will decode the information. A typical
>pass lasts about 9 minutes. I have a large antenna that rotates and, a
>satellite track program to know where and when it will appear. hope this
>helps, 73, Greg KB7WFO Tucson AZ USA

Greg:

What you say certainly helps. I've been looking at the latest Tucker
catalog for a TNC. I have the computer and scanner and satellite tracking
program.

Isn't there an amateur radio/satellite group in Tucson that produces TNC
kits?

Thanks for the info.

Ryan Rudnicki
rr03@academia.swt.edu

ps. MIR has been silent the past few days (Tuesday - Thursday, Nov22-24)
as it has crossed over the south central U.S. I've heard neither packet
nor voice. Do you know of any reason why?

1972. QRZ 144 Mhz EMEers de NC7K - Now at 800 Watts!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 17:21:00 UTC
From: tim.marek@megasystem.com
Message-ID: <215.588.1443@megasystem.com>
Source record: 26382

Recently I purchased from the N6AMG estate a KW amp for 2M using a pair of 4CX250Bs. Made by Motorola for the military in Vietnam It delivers a solid 800 Watts output. Couple that into 4 X 13 ele DJ9BV 3.2 Wavelength yagis and maybe some folks will hear me this month. Using 350W from a single 4CX250B left alot to be desired! I plan to try CQing a bit between .024 and .035 depending on QRM. Hope to work you all.
73s from DM09ep... de Tim - NC7K ...SK

1973. APT scan converting software for macintosh

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 17:58:28 UTC
From: rhought@eis.calstate.edu
Message-ID: <3b58k4$7m9@eis.calstate.edu>
Source record: 26376

I'm a high school physics teacher looking for challenging projects for my brightest students. I would like to use a macintosh computer as a digital signal processer to convert and display NOAA APT satellite weather images. It seems that it should be possible to use the mac's A to D capability to digitize the amplitude modulated 2400 Hz carrier and then write an application to act as a scan converter to convert the digitized sound file to a PICT or some other kind of graphic format. I would guess that timing to get the right scan pattern would be the tricky part.

If anyone out there knows of such a program I'd be interested before we reinvent the wheel! --

Thanks,

Bob Houghton
John A. Rowland High School
Rowland Heights, California

1974. kimsat opinions

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 22:59:06 UTC
From: billv@olympus.net
Message-ID: <billv.108.0016FCE0@olympus.net>
Source record: 26381

Has anyone used the new windows software from amsat? I believe it is called kimsat and provides the software to work all the packet satellites.

1975. Re: QSL MIR? Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-25 23:09:56 UTC
From: joverloc@k12.ucs.umass.edu
Message-ID: <1994Nov25.230956.9301@k12.ucs.umass.edu>
Source record: 26377

In a previous article, asirene@v9001.ntu.ac.sg () says:

>Hi,
>
> Can someone tell me how to go about getting a QSL
>from the MIR? I managed to work itbut lost it while sending
>a message because it went out of range. Does this qualify me
>for a QSL? Who should I send anything to? Any information
>would be appreciated. Thanks.
>
>73 de 9V1ZV Daniel
>

9V1ZV de N1SJS

Unfortunatly the mir dosn't give QLS card. But congagulations on the
contact!!!

73 9V1ZV de N1SJS
Joe Overlock
joverloc@k12.ucs.umass.edu

1976. FAQ location or Help on Sarex

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 03:01:19 UTC
From: aa770@cfn.cs.dal.ca
Message-ID: <Czutq9.8Hz@cs.dal.ca>
Source record: 26378

Tnx for reading I am looking for one of two things either a location of
FAQ's for this conf. (I looked in oak & funet) or I need to know who to
contact for a pre-arranged QSO during a Sarex Mission in June of 1995.
I am doing this on Behalf of the Special Event stations CG7H & CG7D
which will be on the air June marking the Canadian G-7 conference taking
while the leaders of 7 leading industrial countries of the world will be
in Halifax, Nova Scotia over the weekend of Jun 18-21. 73's
--

____
| /_ /_ / |
Robert Harplle / /	/ Net: aa770@cfn.cs.dal.ca
Callsign VE1BT	AX.25 VE1BT@#VE1BBS.NS.CA
Locator FN84il	
Dartmouth, Nova Scotia	Canada
____

1977. Re: NOAA Sat. Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 04:22:28 UTC
From: eareckso@netcom.com
Message-ID: <earecksoCzuxHG.EEq@netcom.com>
Source record: 26379

RossL40555 (rossl40555@aol.com) wrote:
: Does anyone know of a modification for the Bearcat 560 that would give it
: the proper i.f. from 35 to 50kHz for receiving APT signals? Secondly,
: does anyone have any experience with the hamtronics or vanguard receivers?
: I am trying to setup a sat. reception system for my elem. science classes
: despite budget restraints and other teachers who think I'm nuts. Any help
: is most welcome.

Haven't seen the 560 but have done it to the Bearcat 145 and 175. Generally, all you have to do is locate the 2nd if filter (ceramic, possibly #SFR455D), small orange rect. shape; replace it with .01mfd capacitor. You will more than likely need a schematic to determine this.

--See also article "73 Amateur Radio Today" magazine, 3/91, page 12.

--Hamtronics have a good reputation, will ending paying slightly more over a modified scanner though, depending on the model.

Software Systems Consulting used to sell modified Bearcat 145s for around $150.

Bill Eareckson
eareckso@netcom.com

1978. Re: APT scan converting software for macintosh

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 04:26:29 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Czuxo5.Fsy@netcom.com>
Source record: 26380

Robert D. Houghton (rhought@eis.calstate.edu) wrote:
: I'm a high school physics teacher looking for challenging projects for my
: brightest students. I would like to use a macintosh computer as a digital
: signal processer to convert and display NOAA APT satellite weather images.
: It seems that it should be possible to use the mac's A to D capability to
: digitize the amplitude modulated 2400 Hz carrier and then write an
: application to act as a scan converter to convert the digitized sound file
: to a PICT or some other kind of graphic format. I would guess that timing
: to get the right scan pattern would be the tricky part.

: If anyone out there knows of such a program I'd be interested before we
: reinvent the wheel! --

: Thanks,

: Bob Houghton
: John A. Rowland High School
: Rowland Heights, California

Try posting this also to:

wxsat-l@ssg.com

Should be someone in their audience that can help.

Bill Eareckson
eareckso@netcom.com

1979. QSLs from Mir

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 15:27:58 UTC
From: bill@halcyon.COM
Message-ID: <199411261526.AA14351@halcyon.com>
Source record: 26383

I got my card from MIR by sending to Box 88 in Moscow. It took almost 3 years to get the card but it did come.

Good luck

Bill, K7RIE
Reply to bill@halcyon.com

1980. solar system CD-ROM

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 17:15:04 UTC
From: paulpha@aol.com
Message-ID: <3b7qeo$o15@newsbf01.news.aol.com>
Source record: 26384

"Voyage Through The Solar System" is a new CD-ROM featuring full motion video and images from NASA and the Jet Propulsion Laboratory in an easy to use program interface.

The package has received great reviews and operates on DOS windows and Mac. USA today describes the images of Jupiter as "impressive". Slide shows, dozens of videos all with imformative narration and wonderful music on each body in our solar system.

For more information E-Mail: Paul PHA

or fax 213-465-2686

1981. Re: QSL MIR? Help!

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 18:37:53 UTC
From: gerheim@sonalysts.com
Message-ID: <3b7va1$fhu@hatch.sonalysts.com>
Source record: 26385

Joe Overlock(McCann HS 97) (joverloc@k12.ucs.umass.edu) wrote:

> In a previous article, asirene@v9001.ntu.ac.sg () says:

> >Hi,
> >
> > Can someone tell me how to go about getting a QSL
> >from the MIR? I managed to work itbut lost it while sending
> >a message because it went out of range. Does this qualify me
> >for a QSL? Who should I send anything to? Any information
> >would be appreciated. Thanks.
> >
> >73 de 9V1ZV Daniel
> >

> 9V1ZV de N1SJS

> Unfortunatly the mir dosn't give QLS card. But congagulations on the
> contact!!!

BULL! I have 2 cards from MIR to prove it. The route is:

RV3DR - Sergej Samburov-Space QSL Manager
Chief of Cosmonaut Amateur Radio
Department NPO Energia
PO 141070, Box 73
Kaliningrad-10 city,
Moscow Area,
RUSSIA

as actually printed on the card, see... (holding card up to screen)

By the way, the QSL's were for getting a BUSY signal from
the packet station, and they indicate 2-way QSO.

73 - AL

--
****
Al Gerheim, N4QN |Opinions expressed here| Sonalysts, Inc.
gerheim@sonalysts.com |are my own. | 215 Parkway North
Work: (203)442-4355 | | Waterford CT 06385
****

1982. ARLK052 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-11-26 19:32:51 UTC
From: w1aw@arrl.org
Message-ID: <$arlk052.1994@ampr.org>
Source record: 26386
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK052
ARLK052 Keplerian data

ZCZC SK20
QST de W1AW
Keplerian Bulletin 52 ARLK052
From ARRL Headquarters
Newington, CT November 26, 1994
To all radio amateurs

SB KEP ARL ARLK052
ARLK052 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94321.03600189 -.00000213 00000-0 10000-3 0 3273
2 14129 26.7507 297.7039 6024214 228.0488 62.2122 2.05884286 57969
RS-10/11
1 18129U 87054A 94322.19980453 .00000026 00000-0 11812-4 0 9911
2 18129 82.9259 215.0000 0011436 324.8813 35.1587 13.72344306371036
UO-11
1 14781U 84021B 94323.50520735 .00000125 00000-0 28945-4 0 7543
2 14781 97.7829 330.9397 0012576 128.9687 231.2635 14.69271801573119
RS-12/13
1 21089U 91007A 94324.87092901 .00000033 00000-0 19000-4 0 7555
2 21089 82.9212 255.2388 0030581 34.5263 325.7866 13.74049994190163
AO-13
1 19216U 88051B 94324.64737600 -.00000111 00000-0 10000-4 0 9962
2 19216 57.6574 219.2092 7246064 355.2474 0.6950 2.09721671 17798
UO-14
1 20437U 90005B 94325.18381281 .00000027 00000-0 27300-4 0 542
2 20437 98.5837 47.7712 0011873 88.7951 271.4592 14.29864183252021
AO-16
1 20439U 90005D 94325.23345546 .00000026 00000-0 27147-4 0 8528
2 20439 98.5931 49.2279 0012188 89.3256 270.9321 14.29918316252042
DO-17
1 20440U 90005E 94325.24241309 .00000034 00000-0 30089-4 0 8532
2 20440 98.5941 49.6158 0012286 88.5017 271.7570 14.30058650252065
```

```
WO-18
1 20441U 90005F 94325.22061438 .00000018 00000-0 23837-4 0 8562
2 20441 98.5923 49.5818 0012819 88.5791 271.6853 14.30031600252068
LO-19
1 20442U 90005G 94325.18811284 .00000037 00000-0 31229-4 0 8521
2 20442 98.5948 49.8492 0013149 88.5770 271.6918 14.30130412252075
FO-20
1 20480U 90013C 94325.86225437 -.00000013 00000-0 47708-4 0 7495
2 20480 99.0614 88.0699 0540867 342.5128 15.7965 12.83228023224350
AO-21
1 21087U 91006A 94326.64806450 .00000094 00000-0 82657-4 0 5419
2 21087 82.9448 25.4432 0035726 4.7040 355.4438 13.74547102191358
UO-22
1 21575U 91050B 94325.22786605 .00000031 00000-0 25088-4 0 5586
2 21575 98.4217 36.4352 0007552 175.2231 184.9028 14.36943999175637
KO-23
1 22077U 92052B 94325.06339387 -.00000037 00000-0 10000-3 0 4516
2 22077 66.0850 311.5246 0014995 249.9007 110.0396 12.86289201106967
KO-25
1 22830U 93061H 94325.73358496 .00000015 00000-0 23367-4 0 3571
2 22830 98.5396 35.4690 0012451 74.7494 285.5062 14.28072446 60183
IO-26
1 22828U 93061F 94325.24233029 .00000015 00000-0 23469-4 0 3278
2 22828 98.6369 39.4488 0011021 95.2085 265.0352 14.28075764 28192
AO-27
1 22825U 93061C 94325.71907230 .00000005 00000-0 19939-4 0 3501
2 22825 98.6396 39.8347 0009319 105.3375 254.8837 14.27641873 60165
PO-28
1 22829U 93061G 94325.25068423 .00000038 00000-0 32795-4 0 3428
2 22829 98.6379 39.4783 0010881 95.6382 264.6038 14.28051546 60115
Mir
1 16609U 86017A 94326.85597627 .00007200 00000-0 10080-3 0 8504
2 16609 51.6461 112.0852 0001919 303.6929 56.3880 15.57980053500747

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
November 29, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

1983. NOAA-J Elements & Frequency?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 10:27:20 UTC
From: mklee@actrix.gen.nz
Message-ID: <Czx91K.96B@actrix.gen.nz>
Source record: 26387

Does anyone know if the preliminary two-line elements for the NOAA-J
launch on Dec 4 is available? If so, where could it be obtained?

What frequency will it be transmitting? Since it will be NOAA 14
when in orbit, will it be 137.50 MHz?

Regards

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

1984. Good FTP Upload site wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 14:14:20 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3ba47s$bl7@news.doit.wisc.edu>
Source record: 26388

Hi all,

I'm N9LTD and I do the EZSAT Report on This Week in Amateur Radio
every other week. I've gotten quite a bit of interest in weather
sat decoding since last week's show and several people have requested
software to decode WX Sats and WEFAX using their Sound Blaster sound
cards.
I've got the software on my BBS in Madison, Wisconsin at
(608) 249-6359, but that's inconvenient for people in other countries.
Does anybody know of a good FTP site I could upload these files to?

Thanks,
Dave, N9LTD

1985. A Challenge to Each of You

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 16:53:56 UTC
From: wizard@sccsi.com
Message-ID: <wizard.8.0010E69D@sccsi.com>
Source record: 26398

I have read some of the postings of this newsgroup for some period of time and I am impressed with the level of expertise shown in receiving sat signals and decoding into "fax photos," from weather satellites.

However, I have a challenge for you to try.... At ftp.digital.com /pub/net/infosys/Netscape there is a new piece of web software called Netscape that will show you how to build your own Web server. For those of you who have all of the sophisticated equipment that we can 1) not afford, 2) not understand, you might want to put your realtime receptions on the web so we can all see them... and, better still would be to use the Netscape facilities for resolution enhancement, if we want a more detailed view.

Hope you are up to it.

1986. SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 17:37:15 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <26373.9411271726@life.ecs.soton.ac.uk>
Source record: 26389

Hi there,

I am looking for SGP4/SDP4 Model of orbit determination implemented in C programming language. Look angles and range are required as output with the Two-line-elements set as initial input.

I understand that Pascal and Fortran implementation can be obtained from archive.afit.af.mil. I don't suppose the C implementation has been completed?

Otherwise, has anyone tried interfacing the Pascal SGP4 library (SGP4-PL2) with a C program? Any particular glitches to watch out?

Thank you.

Yours,
Liang S. Ng
Southampton Univ.

1987. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:04:41 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Czxu7t.IL5@netcom.com>
Source record: 26390

Rolf Mathison (rolf_mathison@HPATC1.desk.hp.com) wrote:

: I've used WXMAN20 and it works well, however the signal I used w waass
: a U.S.C.G. HF retransmission not directly from the satellitte. I
: think you might have a problem with the direct reception because of
: the circular polarization and the bandwith of your receiver. But
: give it a shot...Its an inexpensive way to get APT.

: Regards,
: Rolf Mathison
: rolf_mathison@HPATC1.desk.hp.com

Plus, APT from the orbiters is an FM signal with an AM subcarrier, which needs to be demodulated to extract the imagery. The software for the Sound-blaster can accomplish this.--Optimum bandwidth for APT is 40-50khz, narrower bandwidths will give up some of the available grey-scale.

Having an antenna that uses right-handed circular polarization will greatly improve the signal; omni-directional antennas do a decent job.

Bill Eareckson
eareckso@netcom.com

1988. Re: NOAA-J Elements & Frequency?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:09:03 UTC
From: eareckso@netcom.com
Message-ID: <eareckso CzxuF3.lx9@netcom.com>
Source record: 26402

Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
: Does anyone know if the preliminary two-line elements for the NOAA-J
: launch on Dec 4 is available? If so, where could it be obtained?

: What frequency will it be transmitting? Since it will be NOAA 14
: when in orbit, will it be 137.50 MHz?

Haven't seen a release of the preliminary Keps as yet, launch has been postponed to Dec. 6.--More than like NOAA-14 will probably be assigned 137.620, since NOAA-11 recently bit the dust.

Bill Eareckson
eareckso@netcom.com

1989. Re: Good FTP Upload site wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:11:19 UTC
From: eareckso@netcom.com
Message-ID: <eareckso Czxulw.J5G@netcom.com>
Source record: 26391

Dave Mullenix (djmullen@facstaff.wisc.edu) wrote:
: Hi all,

: I'm N9LTD and I do the EZSAT Report on This Week in Amateur Radio
: every other week. I've gotten quite a bit of interest in weather
: sat decoding since last week's show and several people have requested
: software to decode WX Sats and WEFAX using their Sound Blaster sound
: cards.
: I've got the software on my BBS in Madison, Wisconsin at
: (608) 249-6359, but that's inconvenient for people in other countries.
: Does anybody know of a good FTP site I could upload these files to?

try: Kestrel.umd.edu /incoming

Browse some of the other directories first though, as I think those files
are already there.

Bill Eareckson
eareckso@netcom.com

1990. Re: Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:30:13 UTC
From: gregm50685@aol.com
Message-ID: <3baj7l$bbq@newsbf01.news.aol.com>
Source record: 26392

In article <3b554j$5bl@central.server.swt.edu>, rr03@nyssa.swt.edu (Ryan Rudnicki) writes:

Ryan- Yes there is, it called (TAPR) Tucson Amateur Packet Radio. Its the company that started packet by offering kits, that you assemble. They usually fit in an IBM- type PC in one of the I/O slots. There is faster more reliable units available in the HRO catalog. Try one of the Baycom TNC's. Its about 60.00 and plugs into the RS232 port. Therefore, it needs no power supply. It will do what you need and, its portable.

Greg.

1991. DSS Keps ????

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:35:25 UTC
From: gregm50685@aol.com
Message-ID: <3bajhd$be2@newsbf01.news.aol.com>
Source record: 26393

Does anyone know the Keps for the new RCA DSS satellite ? It is stationary.

THX
Greg
KB7WFO, Tucson Az

1992. Re: kimsat opinions

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:40:12 UTC
From: gregm50685@aol.com
Message-ID: <3bajqc$bev@newsbf01.news.aol.com>
Source record: 26394

In article <billv.108.0016FCE0@olympus.net>, billv@olympus.net (Bill Vaughn) writes:

Bill, its calledl WINSAT (Windows-Satellite) and is becoming popular already. I have used it at some HAMFESTS, it works very well so far. Contact an AMSAT member or AMSAT direct if you want to purchase.

Greg KB7WFO Tucson AZ

1993. Re: SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 18:57:57 UTC
From: rparsons@bga.com
Message-ID: <rparsons-2711941257570001@slip225.bga.com>
Source record: 26395

In article <26373.9411271726@life.ecs.soton.ac.uk>, lsn92@ecs.soton.ac.uk
(L S Ng) wrote:

> Hi there,
>
> I am looking for SGP4/SDP4 Model of orbit determination implemented in C
> programming language. Look angles and range are required as output with
> the Two-line-elements set as initial input.
>

I am looking for the same thing. If you get e-mail responses, please post
of forward them.

Ron W5RKN

1994. Does black PVC pipe have an effect ?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 19:10:44 UTC
From: gkennedy@helix.net
Message-ID: <n9CskClgnEIP055yn@helix.net>
Source record: 26396

Good Morning/Afternoon/Evening/Whatever !!!

I have recently built a quadrifilar helix antenna for my APT work (137 MHz), but I am noticing some strange nulls in the pattern.

I am using *BLACK* PVC pipe as the main structure for this antenna, and metallic parts, other than the elements.

My question is this: I have heard rumors that the pigment in the pipe is mostly Carbon Black, and that this may affect the efficiency of the antenna, as the pigment will cause the pipe to act as an element. WHITE PVC doesn't have this problem.

Is this true ? I've never heard any discussions about this before, nor have I seen any references to this in any antenna books I have seen over the years.

Also, does anyone know what effect painting the elements has ? I have to do something to protect them from the monsoons we have here in Vancouver, and I want to make the antenna as inconspicuous as possible (I painted the elements black......).

Thanks in advance for your input !!

Geoff L. Kennedy
"Kennedy's Space Centre" :-)
gkennedy@helix.net

1995. Re: Good FTP Upload site wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 21:21:14 UTC
From: jgrubs@voxbox.norden1.com
Message-ID: <46wgwc2w165w@voxbox.norden1.com>
Source record: 26397

```
-----BEGIN PGP SIGNED MESSAGE-----

djmullen@facstaff.wisc.edu (Dave Mullenix) writes:

> Hi all,
>
> I'm N9LTD and I do the EZSAT Report on This Week in Amateur Radio
> every other week. I've gotten quite a bit of interest in weather
> sat decoding since last week's show and several people have requested
> software to decode WX Sats and WEFAX using their Sound Blaster sound
> cards.
> I've got the software on my BBS in Madison, Wisconsin at
> (608) 249-6359, but that's inconvenient for people in other countries.
> Does anybody know of a good FTP site I could upload these files to?

oak.oakland.edu is the obvious choice. They originate SimTel, the
sysadmin is a ham, etc.

-----BEGIN PGP SIGNATURE-----
Version: 2.6.2

iQCVAwUBLtj4i974r4kaz3mVAQELaQQAq6VUiiTVZ1y0k8uivy8T6v3L9ANpJOLh
u4RqPGN7+JFixDLE11WDFsEZDpqYqDwoj3JLcKzFc/8ZxgDQZ/6THfdf10BfMNs9
unkH+envARWZJ62s5g/th9JfzT1hufWgBaVA+alxthDWmicI4L4KHl+7133r+PVY
liXjzkzy6HE=
=bLHX
-----END PGP SIGNATURE-----

...
"The greatest dangers to liberty lurk in the insidious encroachment of men
of zeal, well meaning but without understanding." - Justice Louis Brandeis
--
jgrubs@voxbox.norden1.com (James C. Grubs, W8GRT)
Voxbox Enterprises, 6817 Maplewood Ave., Sylvania, Ohio 43560-1956
Tel.: 419/882-2697
```

1996. REJECTED: Ham-Space Digest V94 #334

Newsgroup: rec.radio.amateur.space
Date: 1994-11-27 23:39:30 UTC
From: op~&rtp41@dg-smtp.ceo.dg.COM
Message-ID: <9411272339.DC00036@rtp41.rtp.dg.com>
Source record: 26400

CEO comments:
See document for message.

CEO document contents:
----- Mail rejected by CEO. -----
No Routing Link Available Mail not sent to:gary rogers@dgc.ceo

----- Unsent message follows -----
From: ham-space@UCSD.EDU
To: Ham-Space@UCSD.EDU
Subject: Ham-Space Digest V94 #334
X-Ceo_Options: Document

CEO comments:
See document for message.

CEO document contents:

Ham-Space Digest Sun, 27 Nov 94 Volume 94 : Issue 334

Today's Topics:
ARLK052 Keplerian data
kimsat opinions
OrbiTrack Documentation?
QSL MIR? Help! (2 msgs)
QSLs from Mir
solar system CD-ROM

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Sat, 26 Nov 1994 14:32:51 EST
From: w1aw@arrl.org
Subject: ARLK052 Keplerian data

SB KEP @ ARL $ARLK052
ARLK052 Keplerian data

ZCZC SK20
QST de W1AW
Keplerian Bulletin 52 ARLK052
From ARRL Headquarters
Newington, CT November 26, 1994
To all radio amateurs

SB KEP ARL ARLK052
ARLK052 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94321.03600189 -.00000213 00000-0 10000-3 0 3273
2 14129 26.7507 297.7039 6024214 228.0488 62.2122 2.05884286 57969
RS-10/11
1 18129U 87054A 94322.19980453 .00000026 00000-0 11812-4 0 9911
2 18129 82.9259 215.0000 0011436 324.8813 35.1587 13.72344306371036
UO-11
1 14781U 84021B 94323.50520735 .00000125 00000-0 28945-4 0 7543
2 14781 97.7829 330.9397 0012576 128.9687 231.2635 14.69271801573119
RS-12/13
1 21089U 91007A 94324.87092901 .00000033 00000-0 19000-4 0 7555
2 21089 82.9212 255.2388 0030581 34.5263 325.7866 13.74049994190163
AO-13
1 19216U 88051B 94324.64737600 -.00000111 00000-0 10000-4 0 9962
2 19216 57.6574 219.2092 7246064 355.2474 0.6950 2.09721671 17798
UO-14
1 20437U 90005B 94325.18381281 .00000027 00000-0 27300-4 0 542
2 20437 98.5837 47.7712 0011873 88.7951 271.4592 14.29864183252021
AO-16
1 20439U 90005D 94325.23345546 .00000026 00000-0 27147-4 0 8528
2 20439 98.5931 49.2279 0012188 89.3256 270.9321 14.29918316252042
DO-17
1 20440U 90005E 94325.24241309 .00000034 00000-0 30089-4 0 8532
2 20440 98.5941 49.6158 0012286 88.5017 271.7570 14.30058650252065
WO-18
1 20441U 90005F 94325.22061438 .00000018 00000-0 23837-4 0 8562
2 20441 98.5923 49.5818 0012819 88.5791 271.6853 14.30031600252068
LO-19
1 20442U 90005G 94325.18811284 .00000037 00000-0 31229-4 0 8521
2 20442 98.5948 49.8492 0013149 88.5770 271.6918 14.30130412252075
FO-20
1 20480U 90013C 94325.86225437 -.00000013 00000-0 47708-4 0 7495
2 20480 99.0614 88.0699 0540867 342.5128 15.7965 12.83228023224350
AO-21

```
1 21087U 91006A 94326.64806450 .00000094 00000-0 82657-4 0 5419
2 21087 82.9448 25.4432 0035726 4.7040 355.4438 13.74547102191358
UO-22
1 21575U 91050B 94325.22786605 .00000031 00000-0 25088-4 0 5586
2 21575 98.4217 36.4352 0007552 175.2231 184.9028 14.36943999175637
KO-23
1 22077U 92052B 94325.06339387 -.00000037 00000-0 10000-3 0 4516
2 22077 66.0850 311.5246 0014995 249.9007 110.0396 12.86289201106967
KO-25
1 22830U 93061H 94325.73358496 .00000015 00000-0 23367-4 0 3571
2 22830 98.5396 35.4690 0012451 74.7494 285.5062 14.28072446 60183
IO-26
1 22828U 93061F 94325.24233029 .00000015 00000-0 23469-4 0 3278
2 22828 98.6369 39.4488 0011021 95.2085 265.0352 14.28075764 28192
AO-27
1 22825U 93061C 94325.71907230 .00000005 00000-0 19939-4 0 3501
2 22825 98.6396 39.8347 0009319 105.3375 254.8837 14.27641873 60165
PO-28
1 22829U 93061G 94325.25068423 .00000038 00000-0 32795-4 0 3428
2 22829 98.6379 39.4783 0010881 95.6382 264.6038 14.28051546 60115
Mir
1 16609U 86017A 94326.85597627 .00007200 00000-0 10080-3 0 8504
2 16609 51.6461 112.0852 0001919 303.6929 56.3880 15.57980053500747

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
November 29, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX

------------------------------

Date: Fri, 25 Nov 1994 22:59:06
From: billv@olympus.net (Bill Vaughn)
Subject: kimsat opinions

Has anyone used the new windows software from amsat? I believe it is
called
kimsat and provides the software to work all the packet satellites.

------------------------------

Date: Thu, 24 Nov 1994 14:24:00 -0500
From: hrsblackwell@hrs.gsfc.nasa.gov (James H. Blackwell Jr.)
Subject: OrbiTrack Documentation?

In article <941123213208000029@g0oanint.demon.co.uk>,
sean@g0oanint.demon.co.uk wrote:

In article <1994Nov21.191439.10771@omega.atk.com>, Rick Whiting
writes:
```

>
> I ran across the satellite tracking program OrbiTrack (for Mac) at
an
> ftp site recently. However, there was no documantation. Does
anyone
> know where the documentation might be found?
>
> By the way, any better satellite program for the Mac SE/Sys. 6
user?
>
> 73/Rick W0TN <rick_whiting@atk.com>
>
Hello Rick,

There is indeed documentation for OrbiTrack however you can only
get it by registering your copy, it is Shareware after all, well
worth the money IMHO.

As to another satellite programme for the Mac SE you might find
MacSat more to your liking. It's really a stripped down version
of OrbiTrack but might suit your needs better on the 9" B&W
screen. I'll try and upload it tonight so it should be available
within the next 48 hours or so.

If you need anymore info please let me know.

FTP site details,

ftp.demon.co.uk /pub/ham/mac

Rick,
I sent in my shareware fee at least a year ago and NEVER got any
docs.
The check was cancelled though. I'd like to know what happened to
further development on what I think is still the best mac-based tracking
program out there.

My 2 cents worth

--
Jim Blackwell
GHRS Project
Computer Science Corporation
NASA/GSFC Code 681.0
Greenbelt, MD 20771

Date: 26 Nov 1994 18:37:53 GMT
From: gerheim@sonalysts.com (Al Gerheim)
Subject: QSL MIR? Help!

Joe Overlock(McCann HS 97) (joverloc@k12.ucs.umass.edu) wrote:

> In a previous article, asirene@v9001.ntu.ac.sg () says:

> >Hi,
> >
> > Can someone tell me how to go about getting a QSL
> >from the MIR? I managed to work itbut lost it while sending
> >a message because it went out of range. Does this qualify me
> >for a QSL? Who should I send anything to? Any information
> >would be appreciated. Thanks.
> >
> >73 de 9V1ZV Daniel
> >

> 9V1ZV de N1SJS

> Unfortunatly the mir dosn't give QLS card. But congagulations on
the
> contact!!!

BULL! I have 2 cards from MIR to prove it. The route is:

RV3DR - Sergej Samburov-Space QSL Manager
Chief of Cosmonaut Amateur Radio
Department NPO Energia
PO 141070, Box 73
Kaliningrad-10 city,
Moscow Area,
RUSSIA

as actually printed on the card, see... (holding card up to screen)

By the way, the QSL's were for getting a BUSY signal from
the packet station, and they indicate 2-way QSO.

73 - AL

--
****
Al Gerheim, N4QN |Opinions expressed here| Sonalysts, Inc.
gerheim@sonalysts.com |are my own. | 215 Parkway North
Work: (203)442-4355 | | Waterford CT 06385
****

Date: 24 Nov 94 00:21:23 +0800
From: asirene@v9001.ntu.ac.sg
Subject: QSL MIR? Help!

Hi,

Can someone tell me how to go about getting a QSL
from the MIR? I managed to work itbut lost it while sending
a message because it went out of range. Does this qualify me
for a QSL? Who should I send anything to? Any information
would be appreciated. Thanks.

73 de 9V1ZV Daniel

Date: 26 Nov 94 15:27:58 GMT
From: bill@halcyon.COM (Bill Everett)
Subject: QSLs from Mir

I got my card from MIR by sending to Box 88 in Moscow. It took almost 3

years to get the card but it did come.

Good luck

Bill, K7RIE
Reply to bill@halcyon.com

Date: 26 Nov 1994 12:15:04 -0500
From: paulpha@aol.com (Paul pha)
Subject: solar system CD-ROM

"Voyage Through The Solar System" is a new CD-ROM featuring full motion
video and images from NASA and the Jet Propulsion Laboratory in an easy
to
use program interface.

The package has received great reviews and operates on DOS windows and
Mac. USA today describes the images of Jupiter as "impressive". Slide
shows, dozens of videos all with imformative narration and wonderful
music
on each body in our solar system.

For more information E-Mail: Paul PHA

or fax 213-465-2686

End of Ham-Space Digest V94 #334
****

1997. Re: Does black PVC pipe have an effect ?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-28 02:43:08 UTC
From: Dave AB5S/7 <72227.1640@CompuServe.COM>
Message-ID: <3bbg3s$7fu$1@mhade.production.compuserve.com>
Source record: 26399

Concerning black PVC:
I'm very sorry to be the bringer of bad news,
but black PVC does indeed mess with RF.
Our LOWFER group learned of this while attempting
to use colored PVC for antenna coils.
White PVC worked very well.
Unfortunately, black paints will also upset your
system, since they also contain carbon black and
other RF-hot compounds.
73 Dave AB5S/7

1998. Re: FAQ location or Help on Sarex

Newsgroup: rec.radio.amateur.space
Date: 1994-11-28 06:38:56 UTC
From: Philip Chien <Pchien@ids.net>
Message-ID: <3bbtu1$226@paperboy.ids.net>
Source record: 26401

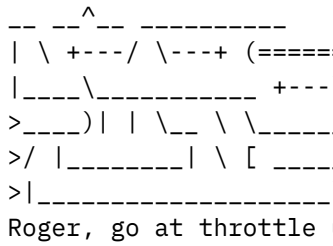
In article <Czutq9.8Hz@cs.dal.ca> Robert Harpelle, aa770@cfn.cs.dal.ca writes:
>Tnx for reading I am looking for one of two things either a location of
>FAQ's for this conf.

I'm working on a FAQ for SAREX and it should be ready to be released in late January 1995, well before the next SAREX mission, STS-67 (currently scheduled for February 1995).

> I need to know who to
>contact for a pre-arranged QSO during a Sarex Mission in June of 1995.

Pre-arranged QSOs can only be set up for educational groups for educational purposes, and the proposals have to be sent in as early as possible to the ARRL educational department. And you're assuming that there's going to be a SAREX mission during your event - not a good assumption to make, even if one happens to happen around then.

Philip Chien, Earth News - space writer and consultant PCHIEN@IDS.NET



Roger, go at throttle up CHR$(32) the final frontier

1999. Re: kimsat opinions

Newsgroup: rec.radio.amateur.space
Date: 1994-11-28 11:05:46 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.54.000B18F9@teleport.com>
Source record: 26405

In article <billv.108.0016FCE0@olympus.net> billv@olympus.net (Bill Vaughn) writes:
>From: billv@olympus.net (Bill Vaughn)
>Subject: kimsat opinions
>Date: Fri, 25 Nov 1994 22:59:06

>Has anyone used the new windows software from amsat? I believe it is called
>kimsat and provides the software to work all the packet satellites.
Almost. It is called Wisp, and it works with most of the packet satellites.
There are some birds that do not use the standard format, but Procomm works
with these just fine.

You can FTP wisp (and a few other things) from ftp.teleport.com in
/pub/users/n7ryw

Bill, n7ryw@teleport.com

2000. Re: Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-11-28 16:25:21 UTC
From: phufh@csv.warwick.ac.uk
Message-ID: <3bd09h$54r@lily.csv.warwick.ac.uk>
Source record: 26403

What baud is currently used the packet operation at MIR, 1200 or 9600?

```
|Andrew David Lambert |phufh@csv.warwick.ac.uk|"I don't like it and I'm sorry|
|3rd Year Physics |g7jaf |I've had anything to do with |
|University of Warwick| |it.".......Quantum Mechanics |
|England_____________|_____________________|ERWIN SCHRODINGER 1887-1961___|
```

2001. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-28 18:51:16 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <3bd8r4$sfp@newsstand.cit.cornell.edu>
Source record: 26404

In article <earecksoCzxu7t.IL5@netcom.com> William A. Eareckson,
eareckso@netcom.com writes:
>Plus, APT from the orbiters is an FM signal with an AM subcarrier, which
>needs to be demodulated to extract the imagery. The software for the
Sound-
>blaster can accomplish this.--Optimum bandwidth for APT is 40-50khz,
narrower
>bandwidths will give up some of the available grey-scale.
>
>Having an antenna that uses right-handed circular polarization will
greatly
>improve the signal; omni-directional antennas do a decent job.
>
>Bill Eareckson
>eareckso@netcom.com

This had me wondering about something - The standard NBFM filters are too narrow to do a good job, but i have a RS2006, which can also do wideband FM. How does that filter work for the satellites in question. I've listened to them go over in WBFM mode and I hear a good signal - but then what I hear might not be what a demodulator needs.

Also, How complicated is the following AM demodulator to build up? Schematics available on an ftp site? (although from reading this, looks like I can plug the 2006 right into the SoundBlaster and off we go. Right?)

Kevin

2002. Re: FAQ location or Help on Sarex

Newsgroup: rec.radio.amateur.space
Date: 1994-11-28 23:05:20 UTC
From: tomsunman@aol.com
Message-ID: <3bdnng$587@newsbf01.news.aol.com>
Source record: 26406

In article <3bbtu1$226@paperboy.ids.net>, Philip Chien <Pchien@ids.net>
writes:

< I'm working on a FAQ for SAREX and it should be ready to be released in
<late January 1995, well before the next SAREX mission, STS-67 (currently
<scheduled for February 1995).

Philip,
Thanks for making up the faq, I would be VERY interested in
getting a copy when it's ready! My license came today by the way! One
more amateur radio operator in the ranks.....KB2SMS.

73,

Tom Randall, KB2SMS

Tomsunman@aol.com Member: AAVSO Solar Division
Amateur radio: KB2SMS "Ooh.....I wet 'em!" (Monty Python)
Warp? Not yet...Windoze? Yhea sure... Try out Geos 2.01!
Ftp to arginine.umdns.edu /pub/geos/publish and get all the files!
Also on America online in the Geoworks area!

2003. APT-Satellites: Report NOV 27, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-11-29 08:23:03 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-291194092230@oskar.gmd.de>
Source record: 26407

```
Observed 50.61 deg NLat, 7.55 deg ELon; NOV 27, 1994

Following the satellite-name you read the approx.
hour (local=sun-time) and motion-direction of the
pass (N=northbound, S=southbound).
This time +/-1.5h is valid for the next 10+ days
to expect the satellite to be visible in range of
northern-hemisphere-stations, add 11h and switch
S<->N for another pass to observe.

NOAA-9 09:S APT 137.62 MHz On
NOAA-10 16:N APT 137.50 MHz On
NOAA-11 16:N APT 137.62 MHz AVHRR dead
NOAA-12 09:S APT 137.50 MHz On
Meteor 2-21 12:S APT 137.85 MHz On
Meteor 3-5 20:N APT 137.85 MHz OFF
OKEAN 1-7 11:N APT 137.40 MHz OFF

APT of OKEAN 1-7 was off during all available
passes. NOAA-11 transmits signal but imaging
is dead. Meteor 3-5 drifted into morning darkness
and is off now. Meteor 2-21 is active, signal is
weak. No other APT-signal 137.00-137.99 MHz
between 0700-1900 UT.
9 days until launch of NOAA-J December 06.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

2004. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-29 13:09:15 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3bf95r$eug@news.doit.wisc.edu>
Source record: 26408

In article <3bd8r4$sfp@newsstand.cit.cornell.edu>, F. Kevin Feeney <fkf1@cornell.edu> says:

>This had me wondering about something - The standard NBFM filters are too
>narrow to do a good job, but i have a RS2006, which can also do wideband
>FM. How does that filter work for the satellites in question. I've
>listened to them go over in WBFM mode and I hear a good signal - but then
>what I hear might not be what a demodulator needs.
>
>Also, How complicated is the following AM demodulator to build up?
>Schematics available on an ftp site? (although from reading this, looks
>like I can plug the 2006 right into the SoundBlaster and off we go.
>Right?)
>
>Kevin

Kevin,
A local ham, KA9WBX, uses a Radio Shack Pro - something scanner set to wide band FM mode and gets great APT pictures. However, he's feeding it with his oscar beams. The main problem with the wide band FM mode is that it's TOO wide band and your signal to noise ratio suffers. The extra gain from the beam makes up for the extra bandwidth. Don't know how it would do with an omnidirectional antenna.

The Sound Blaster is being used essentially as an analog to digital converter and the amplitude of the 2400 Hz tone is determined by actually measuring it.

The converter in the "Weather Satellite Handbook" uses an op-amp to rectify the 2400 Hz tone, then it runs that signal into an 8 bit analog to digital converter and your computer eventually ends up measuring its amplitude too.

Dave, N9LTD

2005. Re: WSIP problem

Newsgroup: rec.radio.amateur.space
Date: 1994-11-29 14:23:34 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.55.000E6505@teleport.com>
Source record: 26161

In article <icesb.46.2EDB54DE@iroe.fi.cnr.it> icesb@iroe.fi.cnr.it (Lapo Pieri) writes:
>From: icesb@iroe.fi.cnr.it (Lapo Pieri)
>Subject: WSIP problem
>Date: Tue, 29 Nov 1994 16:20:46 GMT

>I've tried to use WISP but I was not able to insert the satellite element.

Insert? To get the elements into the program, choose "Database" from the main GSC menu, and then "Update Satellite Database". You can then get the elements in from an Amsat or 2-Line type file. Make sure there is no extra text in a 2-line file, or it won't get read right.

Then, you need to select "Setup" and then "Satellite Setup" and enter all of the information for a satellite in the boxes. There is quite a bit of information needed here, and be sure to get it all in or it won't work.

>I'm not a registred user, so I've pressed the button "I wont a trial",but
>following the setup instruction gived in GETSTART.TXT I haven't had any
>satelllite in the database.
>Is the unregistred capability limitated to a quick look to the graphic
>interface of the program or some error was made by me?

It is fully functional in every way. Above all, make sure that the element file you are using does not have any "junk" text. Most do when they are sent. Also be sure to go through all of the setup menus and enter all of the information requested.

Have fun!
Bill, n7ryw@teleport.com

2006. WSIP problem

Newsgroup: rec.radio.amateur.space
Date: 1994-11-29 16:20:46 UTC
From: icesb@iroe.fi.cnr.it
Message-ID: <icesb.46.2EDB54DE@iroe.fi.cnr.it>
Source record: 26409

I've tried to use WISP but I was not able to insert the satellite element.
I'm not a registred user, so I've pressed the button "I wont a trial", but
following the setup instruction gived in GETSTART.TXT I haven't had any
satelllite in the database.
Is the unregistred capability limitated to a quick look to the graphic interface
of the program or some error was made by me?
Thank's in advance
Lapo IK5NAX

Lapo Pieri IK5NAX | Internet:
| lpieri@nyx.cs.du.edu
Istituto per la Ricerca sulle Onde Elettromagnetiche | icesb@iroe.fi.cnr.it
del Consiglio nazionale delle Ricerche (IROE-CNR) |
| phone: +39 55 4235 276
[Istitute for the Research on Electromagnetic Waves | home: +39 55 410209
of the National Council of Research] |

2007. Re: WSIP problem

Newsgroup: rec.radio.amateur.space
Date: 1994-11-29 19:31:08 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3bfvhs$75c@cello.gina.calstate.edu>
Source record: 26172

I used WISP for about a month before I registered it. As far as I can tell the unregistered program is fully functional. The only effects of being unregistered are the annoying "register me" window that you described and the fact that the unregistered copy places a code (letter W?) in the keywords field of any message that you upload to a satellite.

Aside from some minor bugs, WISP is a *wonderful* program. It makes working the microsats a very straightforward task. It is *well* worth the $40 registration fee.

73,

Bob Houghton

2008. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-29 21:10:52 UTC
From: "F. Kevin Feeney" <fkf1@cornell.edu>
Message-ID: <3bg5cs$pmr@newsstand.cit.cornell.edu>
Source record: 26410

In article <3bf95r$eug@news.doit.wisc.edu> Dave Mullenix,
djmullen@facstaff.wisc.edu writes:
>Kevin,
> A local ham, KA9WBX, uses a Radio Shack Pro - something scanner set
>to wide band FM mode and gets great APT pictures. However, he's feeding
>it with his oscar beams. The main problem with the wide band FM mode
>is that it's TOO wide band and your signal to noise ratio suffers. The
>extra gain from the beam makes up for the extra bandwidth. Don't know
>how it would do with an omnidirectional antenna.

Hmm, well I have oscar beams too, so that should work. But beyond that, I
imagine you might be able to post process the audio some to improve the
signal to noise ratio. But the soundblaster probably already does that
for you.
>
>The Sound Blaster is being used essentially as an analog to digital
>converter and the amplitude of the 2400 Hz tone is determined by
>actually measuring it.

Neat. I'm going to have to fetch this down and try it.
>
>The converter in the "Weather Satellite Handbook" uses an op-amp to
>rectify the 2400 Hz tone, then it runs that signal into an 8 bit
>analog to digital converter and your computer eventually ends up
>measuring its amplitude too.
>
>Dave, N9LTD
>

That doesn't sound too hard either. We'll have to get a look at it. I
should probably put that book on my christmas list.

Thanks

Kevin, WB2EMS

2009. Re: Does black PVC pipe have an effect ?

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 06:45:10 UTC
From: gkennedy@helix.net
Message-ID: <UA1tkClgn6mJ055yn@helix.net>
Source record: 26162

In article <3bbg3s$7fu$1@mhade.production.compuserve.com>, Dave AB5S/7 wrote:
> Concerning black PVC:
> I'm very sorry to be the bringer of bad news,
> but black PVC does indeed mess with RF.
> Our LOWFER group learned of this while attempting
> to use colored PVC for antenna coils.
> White PVC worked very well.
> Unfortunately, black paints will also upset your
> system, since they also contain carbon black and
> other RF-hot compounds.
> 73 Dave AB5S/7

Thanks for the info, Dave.

Sigh....looks like I have to go shopping....I don't think the local
store has white PVC.....anyway, the existing pipe should be easy to
replace.....

I just don't like the thought that the antenna will now be less
conspicuous....right now you can almost stare right at it and not know
it's there <grin> !!!

****
* Geoff L. Kennedy ** Located on the WE[s]T Coast of *
* "Kennedy's Space Centre" 8-) ** Beautiful British Columbia ! *
* E-mail: gkennedy@helix.net ** Coquitlam, BC, Canada *
****

2010. Re: Wefax Reception

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 17:20:04 UTC
From: jcarter@orl.mmc.com
Message-ID: <3bic84$9mo@theopolis.orl.mmc.com>
Source record: 26163

In article IL5@netcom.com, eareckso@netcom.com (William A. Eareckson) writes:
/Rolf Mathison (rolf_mathison@HPATC1.desk.hp.com) wrote:
/
/: I've used WXMAN20 and it works well, however the signal I used w waass
/: a U.S.C.G. HF retransmission not directly from the satellitte. I
/: think you might have a problem with the direct reception because of
/: the circular polarization and the bandwith of your receiver. But
/: give it a shot...Its an inexpensive way to get APT.

Pick up a copy of Electronics Now dated August 1994. You will find plans
on building a turnstile dipole for satellite wefax reception. I have received
satellite weather fax on my Kenwood R-2000 with the VHF option. It works fine for this.

The exact freqs are:

NOAA-9 137.62 MHZ
NOAA-10 137.5 MHZ
NOAA-11 137.62 MHZ
NOAA-12 137.5 MHZ

By the way, WeatherMan version 3.0 is on the way soon. It has automatic
phasing and a tuner built in. For more information please contact
the author of WeatherMan Paul Hitchcock at "paulhtc@netcom.com".

73's
Jim

\/\/ * \/ _._. __._ /\/\/ | James A. Carter (Jim) | jcarter@orl.mmc.com |
/|\ | Senior Software Engineer |_____|
/\|/\ K D 4 P O N | Martin Marietta | These views are my own |
/\/|\/\ ORLANDO | Mail Point 138 | and not that of my |
/\/\|/\/\ FLORIDA USA | 5600 Sand Lake Road | employer. |
/\/\/|\/\/_____| Orlando, FL 32819-8907 |_____73's_Jim ____|

2011. Re: SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 19:29:10 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <3286.9411301531@monet.ecs.soton.ac.uk>
Source record: 26164

Ronald G. Parsons writes:
>
> > I am looking for SGP4/SDP4 Model of orbit determination implemented in C
> > programming language. Look angles and range are required as output with
> > the Two-line-elements set as initial input.
>
> I am looking for the same thing. If you get e-mail responses, please post
> of forward them.

Hi,

Not much luck though. I don't think there is a completed C library for SGP4/SDP4 at the moment, although Dr. Telso who wrote the Fortran and Pascal library mentioned there was such a plan.

So the next best thing is to call the Pascal function from a C program.

There is a glitch (in Pascal to C interfacing) which I just found, and it is quite a big one actually:

Turbo Pascal does not generate Object codes which you can link with a C program!

So the next best thing to do is to the compile Pascal SGP4/SDP4 library into binaries (.EXE or .COM) and put the SGP4/SDP4 binaries resident in memory. Create some interrupt hooks to the resident SGP4/SDP4 functions which can be called from another (C or others) program.

This is just what I plan to do with it.

Hope this helps. Any other suggestions?

Yours,
Liang S. Ng
Southampton University

2012. WISP Problem

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 19:37:38 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3bika2$48s@cello.gina.calstate.edu>
Source record: 26173

Starting yesterday, I began having a strange problem with the satellite scheduler feature of WISP. The scheduler is listing predictions with the date set to 1-1-70. At first, the "correct passes were displayed along with these incorrect ones. Today (November 30) only the passes dated 1-1-70 are displayed. This effectly blocks WISP from running the MSPE module to begin a satellite pass. The problem is date related: If I set the system clock back a few days, everything works ok. Is this a bug in WISP or am I overlooking something?

Here is the info on the software I'm running:

WISP registered running under windows 3.1 / PC dos 5.0

GSC 0.84d
View-Dir 0.75a
MSPE 0.98g
UpdKeps 0.70
MsgMaker 1.13
ProcMail 0.94
MsgView 0.98A

If anyone has any suggestions or knows of a fix, I'd appreciate your help.

73 de KC6LVG -- Bob

2013. Re: SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 20:57:34 UTC
From: rparsons@bga.com
Message-ID: <rparsons-3011941457340001@slip196.bga.com>
Source record: 26165

In article <3286.9411301531@monet.ecs.soton.ac.uk>, lsn92@ecs.soton.ac.uk
(L S Ng) wrote:

> Not much luck though. I don't think there is a completed C library for
> SGP4/SDP4 at the moment, although Dr. Telso who wrote the Fortran and
> Pascal library mentioned there was such a plan.
>
>
> Yours,
> Liang S. Ng
> Southampton University

That would be no problem in my environment. MPW Pascal and MPW C are
compatible. Where is the Pascal library?

Ron W5RKN

2014. ignore, just testing

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 22:51:21 UTC
From: city@PROBLEM_WITH_INEWS_DOMAIN_FILE
Message-ID: <3bivl9$fho@goliat.eik.bme.hu>
Source record: 26170

has this been posted ?

2015. Re: SGP4/SDP4 Library in C

Newsgroup: rec.radio.amateur.space
Date: 1994-11-30 23:07:14 UTC
From: manfred@sunspot.ssl.berkeley.edu
Message-ID: <3bj0j2$pu@agate.berkeley.edu>
Source record: 26166

I went through the painful procedure and translated the Fortran code for the SGP4 model into C. It's part of SatTrack now. I have started to do the same for the SDP4 model, but that is even more painful. I'm getting there, though. Stay tuned...

Manfred

Manfred Bester
Space Sciences Lab
UC Berkeley

2016. Where to ftp NBSCOM ver. 1.9a

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 00:22:32 UTC
From: Wayne_Estes@csg.mot.com
Message-ID: <9411301822.ZM16716@SALCIUS2>
Source record: 26167

Does anyone know of an ftp site where I can get NBSCOM version 1.9a ?

This is an updated version of the program in Instant Track that dials the
(former) National Bureau of Standards to update the time of the DOS clock.

The new version allows one to specify the IRQ and COM port address.

73 de Wayne Estes WD5FFH wayne@csg.mot.com

2017. Re: Translate MIR packet bursts

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 01:35:22 UTC
From: gregm50685@aol.com
Message-ID: <3bj98q$frn@newsbf01.news.aol.com>
Source record: 26168

In article <3bd09h$54r@lily.csv.warwick.ac.uk>, phufh@csv.warwick.ac.uk (Andrew Lambert) writes:

Andrew- MIR uses 1200 bps.

Greg, Tucson AZ

2018. 144 Mhz EME - Minimal Station Requirements

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 07:04:00 UTC
From: tim.marek@megasystem.com
Message-ID: <215.608.1443@megasystem.com>
Source record: 26171

I've seen some message here that leave me thinking some folks are confused about the mechanics involved in EME (Earth Moon Earth) communications. First of all practically ALL EME communications are done using CW. Signals are SO weak their barely above the noise floor. Of course the superstations like W5UN and K5GW can be copied with a single yagi at Moonrise but one interested in consistant results on 144 Mhz should aim for the following station...
4 Yagis at least 3.2 Wavelengths long in phase on a "H" frame of some sort (Usually 13 FT. square) that can elevate as well as rotate so it can track the Moon as it traversesthe sky.
A .5 DB or less noise figure Preamp with 20+ DB gain.
700 or more watts output from a High Power PA.
A good reciever coupled into some audio filtering.
A station with these parameters will be 3 DB above the noise at Perigee barring atmospheric/Lunar conditions.
My station is all homebrew including the Rotor and Thrust Bearing plates, Antennas, H frame, and elevation drive. Its up 23 ft so when elevated it clears the roof yet allows one on the roof to perform periodic maintaince without to much trouble. This is all for 2 Meters mind you... On 432 Mhz it a bit differant... With the smaller wavelength Dish antennas start to become reasonable in size and are gaining in popularity. Regardless how you get on the Moon, It's never a sure thing even for the big boys. I guess thats why I enjoy it so much... You never know what to expect next. I hope this has given some of you something to ponder. For a real good history or "Weak Signal" VHF work including EME I highly suggest picking up from ARRL a copy of "Beyond Line of Sight" by Emil Pocock - W3EP. It's a wealth of info I wish existed when I got started chasing grids back in 91' 73s es DX from DM09ep de NC7K...sk
Tim.Marek@Megasystem.Com

2019. Wisp problem -again

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 08:04:05 UTC
From: icesb@iroe.fi.cnr.it
Message-ID: <icesb.48.2EDD8375@iroe.fi.cnr.it>
Source record: 26169

Thank you for all suggestion. But I think that the package I've got, called WISP1307.ZIP, has some bug since following the starting up passes I can't have any satelite in the database, neither is possible to insert orbital element by hand.
I've notice that the file containing the 2 line element (with no additional text) is realy opened by wisp since I can get sharing error from another task, but the effect of updating/creating database is only the zeroing the file WISP.KEP (4500 bytes of 0s).
The package I've got should came by ucsd or a mirror of it or maybe nic.funet.fi by I don't remember properly.
I'll try to download the wisp package again from ftp.teleport.com, but I think to a real bug I the version I've tried.
Thanks for help

Lapo Pieri IK5NAX

2020. Re: WISP Problem

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 13:21:40 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.58.000D5CE1@teleport.com>
Source record: 26174

In article <3bika2$48s@cello.gina.calstate.edu> Robert D Houghton
<rhought@cello.gina.calstate.edu> writes:
>From: Robert D Houghton <rhought@cello.gina.calstate.edu>
>Subject: WISP Problem
>Date: 30 Nov 1994 19:37:38 GMT

>Starting yesterday, I began having a strange problem with the satellite
>scheduler feature of WISP. The scheduler is listing predictions with the
>date set to 1-1-70

>GSC 0.84d
>View-Dir 0.75a
>MSPE 0.98g
>UpdKeps 0.70
>MsgMaker 1.13
>ProcMail 0.94
>MsgView 0.98A

>If anyone has any suggestions or knows of a fix, I'd appreciate your help.

Get the newer versions of the files! Chris identified this problem and has
fixed it in the latest GSC. There were some changes a few versions back that
require all the new files, so replace ALL old files at one time.
They are at:

ftp.teleport.com/pub/users/n7ryw

If you have WWW, use it instead at:

http:/www.teleport.com/~n7ryw/asatpage.html

The WWW has the version numbers listed, so you can compare and get the files
you need.

Good Luck!
Bill, n7ryw@teleport.com

2021. Re: Wisp problem -again

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 13:26:01 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.59.000D6F6A@teleport.com>
Source record: 26175

In article <icesb.48.2EDD8375@iroe.fi.cnr.it> icesb@iroe.fi.cnr.it (Lapo Pieri) writes:
>From: icesb@iroe.fi.cnr.it (Lapo Pieri)
>Subject: Wisp problem -again
>Date: Thu, 1 Dec 1994 08:04:05 GMT

>Thank you for all suggestion. But I think that the package I've got, called
>WISP1307.ZIP, has some bug since following the starting up passes I can't have
>any satelite in the database, neither is possible to insert orbital element by
>hand.
>I've notice that the file containing the 2 line element (with no additional
>text) is realy opened by wisp since I can get sharing error from another task,
>but the effect of updating/creating database is only the zeroing the file
>WISP.KEP (4500 bytes of 0s).

If you are getting a sharing error, you need to be using SHARE.EXE to enable
file sharing, or Wisp won't work properly (or at all). See the help file for
some settings for Share.

>The package I've got should came by ucsd or a mirror of it or maybe
>nic.funet.fi by I don't remember properly.
>I'll try to download the wisp package again from ftp.teleport.com, but I think
>to a real bug I the version I've tried.

Definitely do! Yours is an old version, so be sure to update all of your
files.

Good Luck!
Bill, n7ryw@teleport.com

2022. Re: EME'ers in Seattle

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 21:45:21 UTC
From: af9y@aol.com
Message-ID: <3blg5h$2ra@newsbf01.news.aol.com>
Source record: 26176

In article <379ncu$m47@nntp1.u.washington.edu>, edsuom@u.washington.edu (Ed Suominen) writes:

Ed,
This is AF9Y. Although I am an Indiana EMEer, I thought that I would respond with an offer to look up info in the EME data base. In fact, maybe I could send you the entire data base and you could investigate the surrounding area. In any event, if you are a ham, you might want to check into the EME net on 14.345 from aprox 1500 to 1800 z every Sat and Sun. CUL de Mike, AF9Y

2023. Re: 144 Mhz EME - Minimal Station Requirements

Newsgroup: rec.radio.amateur.space
Date: 1994-12-01 21:49:27 UTC
From: mack@ncifcrf.gov
Message-ID: <D05JAF.5Hv@ncifcrf.gov>
Source record: 26177

In article <215.608.1443@megasystem.com> tim.marek@megasystem.com (Tim Marek) writes:

>...
>one interested in consistant results on 144 Mhz
>should aim for the following station...
>4 Yagis at least 3.2 Wavelengths long in phase on a "H" frame of some
>sort (Usually 13 FT. square) that can elevate as well as rotate so it
>can track the Moon as it traversesthe sky.
>A .5 DB or less noise figure Preamp with 20+ DB gain.
>700 or more watts output from a High Power PA.
>A good reciever coupled into some audio filtering.
>A station with these parameters will be 3 DB above the noise at Perigee
>barring atmospheric/Lunar conditions.
>My station is all homebrew including the Rotor and Thrust Bearing
>plates, Antennas, H frame, and elevation drive. Its up 23 ft so when

>I hope this has given some of you something to
>ponder.
> 73s es DX from DM09ep de NC7K...sk
>Tim.Marek@Megasystem.Com

Tim has quite a station, particularly being all home brew. The thought
of building, buying or whatever a similar station is what stopped me
from doing EME for many years. I just don't have the resources to do that.
Tim can hear his own echoes. That makes him a big gun in my books.

I started last year with 2 long yagis mouted vertically on a horizontal
cross boom, with a TV style rotator motor turned sideways (it only had
to last one weekend, it did) as the elevator motor. I used a bought
ARR preamp and a 400W brick. It was all bought.
I worked W5UN and heard 5 others. It was really
the biggest blast I'd had in 30yrs of ham radio. It was enough encouragement
to do it bigger this year. If I hadn't been able to do it in a small way
last year, with the promise of being able to work something like VE3ONT,
I wouldn't have done it at all, and I would have missed out and I
still would not be doing it this year.

This year I built some yagis for 432 and worked NC1I (the biggest
station on 432) - again one contact for a years work, and that took an
hour of NC1I's time (thanks Frank).

You don't have to climb all hills at once like the pioneers of
EME did. A little bit at a time is also OK. It took me 20 yrs of thinking of
it in Tim's terms before I could do it this way.

Joe NA3T (operated as NV3Z)

2024. Re: Does black PVC pipe have an effect ?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-02 04:01:13 UTC
From: dshirah@spartan.com
Message-ID: <3bluqs$36a@data.interserv.net>
Source record: 26178

Try camo. paint. I live where I want to hide antennas..I have had good luck with these paints...

2025. Equipment needed

Newsgroup: rec.radio.amateur.space
Date: 1994-12-02 14:29:16 UTC
From: wizard@news.sccsi.com
Message-ID: <3bnavs$nim@tattoo.sccsi.com>
Source record: 26182

Where can I get a definitive list of the equipment to put on my 60 Mhz Pentium processor, with Hayes ultra 14400 modem, to receive picture transmissions from satellites.
Thanks for the help.
--
John F. Regus |
(713) 960-0045 | SYS/370/390 SYSTEM SOFTWARE ENGINEERING
WUI:REGUSHOU |

2026. any Amsat/Oscar with FM/FSK/AFSK downlinks?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-02 15:32:08 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <3bnelo$euj@monet.ecs.soton.ac.uk>
Source record: 26179
Cross-posted to: uk.radio.amateur,rec.radio.amateur.space

Hi,

I am looking for any amateur satellites/OSCAR with FM/AFSK/FSK downlinks and their frequencies.

I have only back issues of AMSAT UK Oscar news until February 1992. And with that I managed to find the frequecies of DO-17, UO-14, UO-22 and KO-23. I am interested if KO-25 has also FM downlink and what its frequecy is. I am also interested in any other OSCAR with FM downlinks.

I would like to resubscribe to AMSAT-UK Oscar News now. But retrieving the back issues could be a problem. Do you have any suggestions?

My main concern is the downlink frequencies of satellites with FM downlinks. Could any one suggest a good source of reference?

Thank you very much.

Yours,
L S Ng
Southampton
(Yet to get a callsign)

2027. Re: any Amsat/Oscar with FM/FSK/AFSK downlinks?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-02 16:29:29 UTC
From: rparsons@bga.com
Message-ID: <rparsons-0212941029290001@slip207.bga.com>
Source record: 26180
Cross-posted to: uk.radio.amateur,rec.radio.amateur.space

In article <3bnelo$euj@monet.ecs.soton.ac.uk>, lsn92@ecs.soton.ac.uk (L S
Ng) wrote:

> Hi,
>
> I am looking for any amateur satellites/OSCAR with FM/AFSK/FSK downlinks
> and their frequencies.

As far I know this is accurate.
Ron W5RKN

CURRENT AMATEUR SATELLITE FREQUENCIES

Satellite UPLINK DNLINK TYPE

AO-10(Oscar10) 435.03-435.18 LSB/CW 145.975-145.825 USB/CW Mode B Analog

AO-13(Oscar13) 435.423-435.573 LSB/CW 145.975-145.825 USB/CW Mode B analog

AO-13 435.602-435.606 USB/CW 2400.715-2400.749 USB/CW Mode S Analog

FO-20 145.9-146.0 LSB/CW 435.9-435.8 Mode J Analog

AO-27 145.85 FM 436.80 FM Part-Time Rptr

AO-21 435.016 FM 145.987 FM Part-Time Rptr

RS-10 145.865-145.905 USB/CW 29.360-29.400 Mode A Analog

RS-12 21.21-21.25 USB/CW 29.41-29.4 Mode K Analog

AO-16(PACSAT) 145.90,.92,.94,.96 FM 437.0513 SSB 1200 Baud PSK

DO-17 145.825 FM 1200 Baud AFSK
and VOICE
WO-18 437.104 SSB 1200 Baud PSK
(img)
LO-19(LUSAT) 145.84,.86,.88,.90 FM 437.1258 SSB 1200 Baud PSK

FO-20(8J1JBS) 145.85,.87,.89,.91 FM 435.91 SSB 1200 Baud PSK

UO-22(UOSAT5) 145.9, .975 FM 435.12 FM 9600 Baud PSK

KO-23(HL01) 145.85, .90 FM 435.175 FM 9600 Baud PSK

KO-25(HL02) 145.98, .87 FM 436.5 FM 9600 Baud PSK

IO-26(ITMSAT) 145.875,.90,.925,.95 FM 435.822 SSB 1200 Baud PSK

POSAT(POSAT1) 145.975 FM 435.2777 FM 9600 Baud FSK

---

1) Frequencies shown are without Doppler compensation. For typical digital satellite pass the original signal will be about 8 kHz higher than what is shown.

2) WO-18 Webersat transmits experimental and image data and can be captured in KISS mode via PB or TLMDC.

3) Except for FO-20 the digital sats use a program suite containing PB/PG/PFHADD/PHS or WISP. The broadcast callsign (in PB.CFG) is the satellite's callsign with an SSID of -11. The connected mode callsign (in PG.CFG) is the satellite's callsign with an SSID of -12.

4) When in mode JD, FO-20 can be worked with any packet program. Connect to 8J1JBS. FO-20 currently alternates between modes JA and JD on a weekly basis. Check ANS bulletins for schedule.

5) AO-10 is no longer controllable but the transponder works when the satellite is in sunlight.

6) For AO-10 and AO-13, transmit LSB, receive USB. As transmitted frequency is increased the received frequency will decrease, (inverting transponder).

7) AO-21 currently operates on a 10 minute schedule with FM repeater, WEFAX image transmission, and 1200 baud AFSK telemetry in each cycle.

Source: The AMSAT Journal, Volume 17, No.3, May/June, 1994 issue, p17. Reprinted on packet with permission of AMSAT-NA, Silver Spring, MD, July 5, 1994.

2028. Re: any Amsat/Oscar with FM/FSK/AFSK downlinks?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-02 16:56:56 UTC
From: Gerald Schmitt <ggs@aerie.lanl.gov>
Message-ID: <3bnnbj$gld@newshost.lanl.gov>
Source record: 26185
Cross-posted to: uk.radio.amateur,rec.radio.amateur.space

Reasonably accurate but AO-21 is dead so nothing will be heard there. FO-20 sends digital a lot of the time the rest of time is on sideband.

2029. HRPT Data for Georgia Coast?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-02 17:12:24 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <3bnkhoINNI7j@gulfaero.com>
Source record: 26181

I have a small AVHRR system, and my apartment does not allow me
enough room to catch all of the Georgia coast from a polar orbitors pass.
I have software to work the raw HRPT data, and I am looking for a
internet connection to near real time HRPT data for Georgia. I have
found a station that does this for Hawaii, and some tiles for the West
Coast.
Has anyone located an internet connection for near real time HRPT
data that covers Georgia? In advance, thank you very much!

Ken
ken_terry@macmail.eng.gulfaero.com

2030. Alinco ALD-24T Mods?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-03 02:53:41 UTC
From: crowner@magnus.acs.ohio-state.edu
Message-ID: <crowner.27.2EDFDDB4@magnus.acs.ohio-state.edu>
Source record: 26183

I just picked up a used Alinco ADT-24T. This is a fairly old radio (several years anyway, I haven't tried to look it up) but it seems like a nice one.

Does anyone have modifications for it for things like 430-440 MHz coverage or wiring in a 9600 baud modem? I'm contacting Alinco for the tech manual, but that takes a few weeks, and previous experieces are hard to beat anyway.

Thanks.

Fred Crowner WD8OTO
crowner+@osu.edu

2031. Re: ZSSRD 2

Newsgroup: rec.radio.amateur.space
Date: 1994-12-03 03:55:03 UTC
From: brent@network.ucsd.edu
Message-ID: <3boq6n$gfu@network.ucsd.edu>
Source record: 26184

In article <b2ee329d%fidonet@p41.f106.n6000.z242.fidonet.org> mora@bb.fido.de (mora) writes:
>Connecting this BBS would be quite expensive from Germany.
>But thanks for this hint!
>
>The international designation is Cosmos 2054.
>
>Does anybody have more informations or even experiences with this bird?

Here are the two lines for the bird you are looking at

COSMOS 2054
1 20391U 89101A 94335.07419160 -.00000127 00000-0 00000-0 0 943
2 20391 2.7237 67.0694 0001843 116.1226 257.0895 1.00267121 18347

The NASA BBS from which these came is also reachable via Internet, if you do not want to pay for the phone call, but would rather have your company or university shout the bill.

The site is "oig1.gsfc.nasa.gov" and is a TELNET site. Login as "oig" with the password of "goddard1" and take it from there. You can then FTP files back to your machine once you are logged into oig1

Brent

2032. Re: NOAA-J Elements & Frequency?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-03 14:16:03 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D08nMs.E5B@netcom.com>
Source record: 26186

Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
: Does anyone know if the preliminary two-line elements for the NOAA-J
: launch on Dec 4 is available? If so, where could it be obtained?

: What frequency will it be transmitting? Since it will be NOAA 14
: when in orbit, will it be 137.50 MHz?

Here's the preliminary Keps for NOAA-J:

Bill Eareckson
eareckso@netcom.com
==========

From wxsat!wxsat-mail-daemon@uu7.psi.com Fri Dec 2 18:14:49 1994
Return-Path: <wxsat!wxsat-mail-daemon@uu7.psi.com>
Received: from uu7.psi.com by mail.netcom.com (8.6.9/Netcom)
id SAA03462; Fri, 2 Dec 1994 18:14:44 -0800
Received: from wxsat.UUCP by uu7.psi.com (5.65b/4.0.071791-PSI/PSINet) via UUCP;
id AA08658 for ; Fri, 2 Dec 94 19:58:42 -0500
Received: by ssg.com (1.64/waf)
via UUCP; Fri, 02 Dec 94 22:22:19 UTC
for wxsat-mail@ssg.com
To: wxsat-mail@ssg.com
Subject: NOAA-J Keps
From: wxsat-mail-daemon@ssg.com (wxsat mailer)
Reply-To: wxsat-l@ssg.com
Message-Id: <222219_96171@ssg.com>
Date: Fri, 02 Dec 94 22:22:19 UTC
Organization: System Support Group
Status: RO

The following is forwarded by the wxsat mail list daemon:

Subject: NOAA-J Keps
From: rick (Rick Emerson)
Date: Fri, 2 Dec 1994 21:33:06 GMT

You want NOAA-J keps? We got NOAA-J keps!

Rick

------- Start of forwarded message -------
NOAA-J
UEF REFERENCE: MONTH, DAY, YEAR 12/06/1994
HOUR, MINUTE, SECONDS: 00:00:0.000

APPARENT SIDEREAL TIME AT THE
REFERENCE TIME ABOVE: 1.30117402 RADIANS

UEF EPOCH: MONTH, DAY, YEAR: 12/06/1994
HOUR, MINUTE, SECONDS: 10:17:1.985

OSCULATING KEPLERIAN ELEMENTS AT EPOCH:

SEMI-MAJOR AXIS: 7237.3832000000 KMS
ECCENTRICITY : 0.0002377100
INCLINATION : 98.8622000011 DEGS
RT ASC OF ASCENDING NODE: 279.7988000000 DEGS
ARGUMENT OF PERIGEE : 284.7206000000 DEGS
MEAN ANOMALY : 256.6316000000 DEGS

INERTIAL POSITION AND VELOCITY AT EPOCH:
X: -1206.03903870 KM XDOT: 1.15577281450 KM/SEC
Y: 7134.67408771 KM YDOT: 0.02364150809 KM/SEC
Z: -165.45257205 KM ZDOT: -7.33026848327 KM/SEC

BROUWER MEAN ELEMENTS AT EPOCH:

SEMI-MAJOR AXIS: 7228.477636651 KMS
ECCENTRICITY : 0.001384281
INCLINATION : 98.867720654 DEGS
RT ASC OF ASCENDING NODE: 279.799095008 DEGS
ARGUMENT OF PERIGEE : 291.169459900 DEGS
MEAN ANOMALY : 250.180349735 DEGS

FIRST TIME DERIVATIVE OF THE RIGHT ASCENSION OF THE ASCENDING NODE,
ARGUMENT OF PERIGEE AND THE MEAN
RASCDOT: 0.989491321 DEG/DAY
ARGPDOT: -2.830225251 DEG/DAY
MEANDOT: 5082.453812477 DEG/DAY

ANOMALISTIC PERIOD: 101.997975591 MINUTES

NODAL PERIOD: 102.054806032 MINUTES

ORBIT NUMBER AT EPOCH: 0
------- End of forwarded message -------

+===+
| The above is supplied via Wxsat mail list |
| Replies to wxsat-l@ssg.com Subscriptions to wxsat-request@ssg.com |
+===+

2033. Re: A Challenge to Each of You

Newsgroup: rec.radio.amateur.space
Date: 1994-12-03 14:20:59 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D08nuz.EGs@netcom.com>
Source record: 26187

John F. Regus (wizard@sccsi.com) wrote:
: I have read some of the postings of this newsgroup for some period of time and
: I am impressed with the level of expertise shown in receiving sat signals and
: decoding into "fax photos," from weather satellites.

: However, I have a challenge for you to try.... At ftp.digital.com
: /pub/net/infosys/Netscape there is a new piece of web software called
: Netscape that will show you how to build your own Web server. For those of
: you who have all of the sophisticated equipment that we can 1) not afford, 2)
: not understand, you might want to put your realtime receptions on the web so
: we can all see them... and, better still would be to use the Netscape
: facilities for resolution enhancement, if we want a more detailed view.

: Hope you are up to it.

Amateur weather satellite imagery is also available at: kestrel.umd.edu
/pub/wxsat. For a look at GOES-8 "Water Vapor" imagery, I just uploaded
G8120294.GIF to the dir /incoming.

Bill Eareckson
eareckso@netcom.com

2034. ARLK053 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-03 21:27:12 UTC
From: w1aw@arrl.org
Message-ID: <$arlk053.1994@ampr.org>
Source record: 26188
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK053
ARLK053 Keplerian data

ZCZC SK21
QST de W1AW
Keplerian Bulletin 53 ARLK053
From ARRL Headquarters
Newington, CT December 3, 1994
To all radio amateurs

SB KEP ARL ARLK053
ARLK053 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94328.80346848 -.00000090 00000-0 10000-3 0 3288
2 14129 26.7355 296.4176 6023898 230.1525 59.2733 2.05880748 58123
RS-10/11
1 18129U 87054A 94335.10467998 .00000043 00000-0 30385-4 0 9948
2 18129 82.9258 205.4648 0010515 285.9727 74.0264 13.72345217372806
UO-11
1 14781U 84021B 94335.55926704 .00000214 00000-0 43967-4 0 7570
2 14781 97.7819 342.4224 0012950 92.5120 267.7567 14.69277448574885
RS-12/13
1 21089U 91007A 94333.24503353 .00000045 00000-0 32032-4 0 7579
2 21089 82.9225 249.0307 0030187 11.8687 348.3172 13.74050513191317
AO-13
1 19216U 88051B 94333.70699234 -.00000472 00000-0 10000-4 0 9970
2 19216 57.6540 217.5974 7247486 355.9625 0.6416 2.09726205 17981
UO-14
1 20437U 90005B 94334.21079278 .00000032 00000-0 29525-4 0 565
2 20437 98.5833 56.6682 0012015 63.8633 296.3773 14.29865712253311
AO-16
1 20439U 90005D 94334.19011950 .00000031 00000-0 29128-4 0 8541
2 20439 98.5926 58.0655 0012273 64.1191 296.1255 14.29919734253329
DO-17
1 20440U 90005E 94334.19819861 .00000040 00000-0 32208-4 0 8554
2 20440 98.5939 58.4569 0012381 63.5832 296.6621 14.30060117253346
```

```
WO-18
1 20441U 90005F 94334.17656887 .00000043 00000-0 33630-4 0 8586
2 20441 98.5928 58.4227 0012940 63.8720 296.3792 14.30033089253340
LO-19
1 20442U 90005G 94334.21341247 .00000045 00000-0 34155-4 0 8544
2 20442 98.5946 58.7604 0013251 63.3783 296.8761 14.30131929253368
FO-20
1 20480U 90013C 94334.36023323 .00000002 00000-0 83735-4 0 7510
2 20480 99.0628 94.9838 0540702 323.2943 33.2241 12.83228274225446
AO-21
1 21087U 91006A 94334.14563813 .00000094 00000-0 82657-4 0 5438
2 21087 82.9430 19.8930 0035357 344.0358 15.9679 13.74547575192384
UO-22
1 21575U 91050B 94334.14080353 .00000066 00000-0 36710-4 0 5609
2 21575 98.4204 45.1516 0007777 148.1633 212.0024 14.36946272176914
KO-23
1 22077U 92052B 94334.00473823 -.00000037 00000-0 10000-3 0 4536
2 22077 66.0837 292.8039 0014856 247.8910 112.0530 12.86289443108118
KO-25
1 22830U 93061H 94334.21137207 .00000013 00000-0 22591-4 0 3597
2 22830 98.5395 43.7585 0012404 51.7704 308.4586 14.28073520 61398
IO-26
1 22828U 93061F 94334.21053519 .00000031 00000-0 30199-4 0 3297
2 22828 98.6363 48.3152 0011103 70.5465 289.6906 14.28077360 29475
IO-26?
1 22826U 93061D 94334.23830090 .00000054 00000-0 39624-4 0 3505
2 22826 98.6398 48.3180 0010106 83.7494 276.4834 14.27749669 61389
AO-27
1 22825U 93061C 94334.76008716 .00000035 00000-0 31815-4 0 3529
2 22825 98.6389 48.7702 0009508 80.6097 279.6156 14.27643541 61453
PO-28
1 22829U 93061G 94334.21904200 .00000039 00000-0 33458-4 0 3446
2 22829 98.6373 48.3455 0010977 70.4788 289.7578 14.28053092 61397
Mir
1 16609U 86017A 94335.89987549 .00006534 00000-0 91722-4 0 8584
2 16609 51.6485 66.7440 0002528 334.6618 25.4248 15.58089691502158

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
December 6, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

2035. Radio Meteor Obs Bull Nov 1994 - Leonids

Newsgroup: rec.radio.amateur.space
Date: 1994-12-03 23:03:10 UTC
From: steyaert@vvs.innet.be
Message-ID: <steyaert.66.00170DD7@vvs.innet.be>
Source record: 26189

Radio Meteor Observation Bulletin No. 16 December 1994

1. FORWARD SCATTER METEOR OBSERVATIONS

Observer: M. De Meyere
Location: Deurle, Belgium (3 37' E, 51 00' N)
Frequency: 66.17 MHz
Transmitter Locations:
Katowice, PR3, Poland, 65.99 MHz, 14 kW, Distance 1100 km
P. Neant, PR3, Romania, 66.17 MHz, 40 kW, Distance 1400 km
Czestochowa, PR3, Poland, 66.23 MHz, 20 kW, Distance 1080 km
Gdansk, PR3, Poland, 66.29 MHz, 40 kW, Distance 1100 km

Antenna: crossed Yagi, 4 elements, Azimuth 270 o (=East), elevation 30 o
Antenna amplifier: 25 dB max level 90 dBmuV
Receiver: commercial, Progresson 447A, TESLA, Bratislava
Sensitivity: 8 muV for S/N = 26 dB (300 Ohm)
Observing method: automated setup, 150 samples/second, 8 bit resolution.
[Time and details of all individual meteor reflections are stored on file
in the University of Ghent format (Prometeos), and are available for
further analysis. Reduction software for DOS and Windows available].

Raw counts of reflections with a duration of at least 0.027 s
during one hour interval starting at UT:

November 1994
Leonids

Nov 1994	20h	21	22	23	00	01	02	03	04	05	06	07
1- 2	115	112	146	100	89	19%	5%	82%	145	149	184	96
2- 3	109	148	137	112	115	31%	42%	142	199	180	161	143
3- 4	107	127	158	109	102	9%	19%	124	136	149	176	167
4- 5	124	145	148	94	101	28%	6%	46%	156	157	131	114
5- 6	104	109	104	99	90	79	13%	6%	60%	115	107	104
6- 7	104	119	126	95	73	6%	4%	71%	126	133	151	134
7- 8	111	113	136	108	74	8%	1%	74	118	152	157	130
8- 9	98	99	112	79	66	5%	3%	49	77	116	102	81
9-10	83	111	117	83	71	3%	5%	91	96	86	102	81
10-11	98	111	113	105	77	12%	3%	44%	88	137	135	82
11-12	92	142	130	89	89	40%	5%	46%	152	132	130	106
12-13	57	91	76	78	49	57	55	49	66	77	83	82
13-14	68	95	91	86	61	14%	3%	48%	91	96	92	59
14-15	-	85	86	65	52	48	1%	82	108	98	123	85
15-16	66	64	81	56	55	55	0%	47	92	80	84	81

```
16-17 | 66 81 97 76 66 8% 2% 60 135 159 100 149
17-18 | 87 85 97 76 200 44% 171% 252* 374* 321* 501* 528*
18-19 | 76 85 85 90 162 10% 28% 172 146 126 151 185
19-20 | 72 77 103 81 78 81 14% 8% 85 115 133 112
20-21 | 65 72 76 68 61 12% 0% 47 98 101 98 97
21-22 | 92 89 99 78 66 11% 4% 78 127 118 115 &
22-23 | 85 75 105 87 62 12% 5% 84 117 119 101 82
23-24 | 82 103 97 92 84 32% 7% 77 86 96 96 93
24-25 | 76 93 110 99 128 47% 51% 47% 117 104 83 149
25-26 | 76 65 88 83 70 23% 3% 62% 111 96 98 84
26-27 | 64 76 107 88 73 64 8% 3% 38% 105 107 103
27-28 | 78 83 95 77 100 7% 4% 81 104 113 79 76
28-29 | 63 91 84 73 71 9% 1% 38% 103 104 117 81
29-30 | 60 82 86 95 81 39% 7% 52% 107 95 107 85
30-01 | 63 81 112 82 58 9% 4% 52% 104 112 111 99
------|------------------------------------------------------------------
1994 | 20h 21 22 23 00 01 02 03 04 05 06 07
Nov |
```

Notes:

. % : transmitter outage during the whole hour or a part of it. Low counts indicate that no other interference, which could be confused with meteors, is picked up.
Few transmitters are broadcasting between 2h-4h local time (Sat-Sun 3h-5h local time) or sometimes longer. (When winter hour is in use: local time = UT + 1h).

. & : manually eliminated for direct reception.

. * very strong Leonid activity on the morning of November 18.
The Leonid radiant rises at 22h30m, and sets at 14h UT. Best forward scatter conditions for this setup around 7h - 8h UT.

Maurice De Meyere / Chris Steyaert

Observer: Ilkka Yrjola
Location: Finland (26 35' E, 60 54' N)
Frequency: 87.360 MHz
Receiver: narrow band FM, detected signal level >-122dBm.
Antenna: 2 element Yagi with 4dBd gain to SW.
Antenna Azimuth: 45 o
Computer: T-1000SE
Data sampling system: threshold crossing detection is fed in binary form (1 bit) from the receiver, to the computer.
Computer logs total hourly elapsed reflection time, number of threshold crossings for the hour, the longest time the signal was continuously above detection level for the hour.

Data stored in the Compact MS-Soft format. Software for viewing available from FTP.FUNET.FI pub/ham/vhf-work/mssoft42.zip

Counts in one hour intervals starting at:

UT	16 Nov	17 Nov	18 Nov	19 Nov	20 Nov 1994
0	269	382	1017*	776	424
1	365	493	1229*	629	
2	363	534	1402*	771	
3	333	506	1104*	696	
4	386	457	1567*	755	
5	322	537	1698*	670	
6	323	409	2310*	538	
7	387	471	1806*	582	
8	289	469	1727*	510	
9	262	552	1403*	669	
10	286	287	879*	468	
11	229	308	1044*	352	
12	238	269	313	272	
13	193	209	273	275	
14	195	179	279	224	
15	189	213	245	251	
16	208	184	210	214	
17	219	231	286	251	
18	255	273	300	300	
19	264	344	328	328	
20	307	328	377	383	
21	388	390	357	426	
22	370	504	456	441	
23	425	693*	477	443	

| UT | 16 Nov | 17 Nov | 18 Nov | 19 Nov | 20 Nov 1994 |

. * very strong Leonid activity on the morning of November 18, with an
OBSERVED peak around 6h UT.
The Leonid radiant rises at 19h30m, and sets at 13h30 UT.

Ilkka Yrlola / Chris Steyaert

Observer: George J. Zay
Location: Descanso, California, USA (116 38' W, 32 50' N)
Height above sealevel: 1003 m
Frequency: 92.90 MHz
Transmitter Location: Flagstaff, Arizona Distance: 538 Km
Transmitter Power: 100 kW ; 24h/day and 7 days a week
Antenna Type: 6 element Yagi, Antenna Azimuth: 60 o, elevation: 45 o
Receiver: JVC RX-302BK Digital Receiver
Method of Observing: Listening

Raw counts of reflections during one hour interval starting at UT:

Oct 1994	02h	03	04	05	06	07	08	09	10	11	12

```
06 | 01* 08 05 11 17 17 12 18 17 10 02&

17 | - - - - - 22 46 41 46 30 28
18 | - - - - - 14 33 41 33 40 40
19 | - - - - - 30 47 52 62 50 58
20 | - - - - - 28 34 39 53 67 50
-------------------------------------------------------------
1994 | 02h 03 04 05 06 07 08 09 10 11 12
Oct
```

& : first 30 minutes of the interval
* : last 30 minutes of the interval

George J. Zay / Jeroen Van Wassenhove

2. ABOUT THE RMOB

The RMOB is an independent initiative of some workers in the field of radio meteor scatter observations and data reduction. It started in August 1993 in order to spread rapidly the Perseid results via E-mail. Since then, it has appeared monthly, and has gradually been expanded.

Typically it contains: summaries of recent observations, first results of stream activity by radio methods, relations between radio and optical meteors, references to other publications in the field of meteor astronomy and radio scatter techniques, announcements of meetings, short questions and answers, non-commercial (second hand) sale of radio equipment, available software.

Contributors are mentioned, and interested persons are asked to contact them directly.

RMOB can be copied freely in unabridged and unmodified form. Extracts should indicate the source (Radio Meteor Obs Bulletin, month and year).

If you want to subscribe (or unsubscribe) to the E-mail distribution list, please send a message to C. Steyaert.
Those not having access to E-mail can obtain a printed copy free of charge from J. Van Wassenhove (current or back-issues).

3. CONTRIBUTORS / USEFUL ADDRESSES

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tel: +32 (9) 282 35 26
Call: ON4NU, packet: ON4NU@ON4AWP
E-mail: via Chris Steyaert

Chris Steyaert, VVS
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fax: +32 (14) 22 13 73
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Ilkka Yrjola
Finland
tel: +358 (951)402 2797
E-mail: ILKKA.YRJOLA@915000.KY.KYMMENE.MEMONET.mailnet.fi

George J. Zay
3946 Paula Street
La Mesa, CA 91941, U.S.A.

--
Christian Steyaert (RMOB9411) 3 December 1994
--

2036. Righttime Prog

Newsgroup: rec.radio.amateur.space
Date: 1994-12-04 08:15:31 UTC
From: mklee@actrix.gen.nz
Message-ID: <D0A1Lv.661@actrix.gen.nz>
Source record: 26190

Could someone please let me know the ftp site and directory for the
software 'RIGHTTIME', which helps keep the PC clock to time?

I've tried to archie, but could not get a successful search.

Mun-Kong Lee
mklee@actrix.gen.nz
Raumati Beach
New Zealand

2037. Re: any Amsat/Oscar with FM/FSK/AFSK downlinks?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-04 10:51:21 UTC
From: Gerald Schmitt <ggs@aerie.lanl.gov>
Message-ID: <3bsolr$jm9@newshost.lanl.gov>
Source record: 26193
Cross-posted to: uk.radio.amateur,rec.radio.amateur.space

This list keeps getting posted AO-21 is dead dead dead.
Delete it from the list it can't be that hard.

2038. Re: NOAA-J Elements & Frequency?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-04 15:43:34 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D0AMCM.2zA@netcom.com>
Source record: 26191

Mun-Kong Lee (mklee@actrix.gen.nz) wrote:
: Does anyone know if the preliminary two-line elements for the NOAA-J
: launch on Dec 4 is available? If so, where could it be obtained?

: What frequency will it be transmitting? Since it will be NOAA 14
: when in orbit, will it be 137.50 MHz?

From wxsat!wxsat-mail-daemon@uu7.psi.com Sat Dec 3 17:59:42 1994
Return-Path: <wxsat!wxsat-mail-daemon@uu7.psi.com>
Received: from uu7.psi.com by mail.netcom.com (8.6.9/Netcom)
id RAA10816; Sat, 3 Dec 1994 17:59:31 -0800
Received: from wxsat.UUCP by uu7.psi.com (5.65b/4.0.071791-PSI/PSINet) via UUCP;
id AA11174 for ; Sat, 3 Dec 94 20:10:57 -0500
Received: by ssg.com (1.64/waf)
via UUCP; Sun, 04 Dec 94 00:10:09 UTC
for wxsat-mail@ssg.com
To: wxsat-mail@ssg.com
Subject: Re: NOAA-J Keps
From: wxsat-mail-daemon@ssg.com (wxsat mailer)
Reply-To: wxsat-l@ssg.com
Message-Id: <0109_11602@ssg.com>
Date: Sun, 04 Dec 94 00:10:09 UTC
Organization: System Support Group
Status: RO

The following is forwarded by the wxsat mail list daemon:

Subject: Re: NOAA-J Keps
From: gkennedy@helix.net (Geoff L. Kennedy)
Date: Sat, 03 Dec 1994 13:32:35 -0800

> The following is forwarded by the wxsat mail list daemon:
>
> Subject: NOAA-J Keps
> From: rick (Rick Emerson)
> Date: Fri, 2 Dec 1994 21:33:06 GMT
>
> You want NOAA-J keps? We got NOAA-J keps!
>
> Rick

Thank you !!!

And from those, I have generated a TLE.....

NOAA 14
1 00001U 94340.42849520 .00000054 00000-0 29743-4 0 17

2 00001 98.8677 279.7991 0013209 292.2182 249.1315 14.11816432 10

It should be close.....my tracking program seems to like it !! <G>

****
* Geoff L. Kennedy ** Located on the WE[s]T Coast of *
* "Kennedy's Space Centre" 8-) ** Beautiful British Columbia ! *
* E-mail: gkennedy@helix.net ** Coquitlam, BC, Canada *
****

+==+
| The above is supplied via Wxsat mail list |
| Replies to wxsat-l@ssg.com Subscriptions to wxsat-request@ssg.com |
+==+

2039. KO-23,KO-25 down?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-04 19:46:24 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.60.0013C691@teleport.com>
Source record: 26194

I have not been able to get any data down from KO-25 or KO-23 for the last couple of days. I have checked in on AO-16, and all works good. I have also used Terminal to see if there is any data at all from these sats, but nothing monitored. Has there been another failure? Has anyone else noticed this?
Bill, n7ryw@teleport.com

2040. Re: any Amsat/Oscar with FM/FSK/AFSK dow

Newsgroup: rec.radio.amateur.space
Date: 1994-12-04 22:42:27 UTC
From: rickmcm@delphi.com
Message-ID: <9412041740592.The_Win-D.rickmcm@delphi.com>
Source record: 26192

In article <3bnnbj$gld@newshost.lanl.gov>, Gerald Schmitt <ggs@aerie.lanl.gov> writes: >

> Reasonably accurate but AO-21 is dead so nothing will be heard
> there. FO-20 sends digital a lot of the time the rest of time
> is on sideband.
>

What happened to AO-27? I thought it was an FM bird.

2041. Re: SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-12-04 23:57:34 UTC
From: gkennedy@helix.net
Message-ID: <INZukClgnMw5055yn@helix.net>
Source record: 26198

In article <3286.9411301531@monet.ecs.soton.ac.uk>, L S Ng wrote:
>
> So the next best thing is to call the Pascal function from a C program.
>
> There is a glitch (in Pascal to C interfacing) which I just found, and
> it is quite a big one actually:
>
> Turbo Pascal does not generate Object codes which you can link with a
> C program!
>

Sure you can !! You should be able to declare them using this
format:

```
extern pascal function(args);
```

(Disclaimer: I haven't personally tried it....just read the Borland
C++ Programmer's Guide....)

```
*****************************************************************************
* Geoff L. Kennedy ** Located on the WE[s]T Coast of *
* "Kennedy's Space Centre" 8-) ** Beautiful British Columbia ! *
* E-mail: gkennedy@helix.net ** Coquitlam, BC, Canada *
*****************************************************************************
```

2042. KO-23 and KO-25 are DOWN

Newsgroup: rec.radio.amateur.space
Date: 1994-12-05 02:07:25 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.61.00021FB4@teleport.com>
Source record: 26196

Yes, it's true, as verified by responses to the previous posting as well as other sources, both Kitsats are DOA (Dead On the Air). They are transmitting dataless carriers, so it may appear that there is something wrong with your equipment. This time, it's the birds gone phlooey again.

Curious that they did it at the same time.

Bill, n7ryw@teleport.com

2043. Re: HRPT Data for Georgia Coast?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-05 05:54:24 UTC
From: rbates@nermal.santarosa.edu
Message-ID: <3bu9ug$l1u@floyd.santarosa.edu>
Source record: 26205

Ken Terry (ken_terry@macmail.eng.gulfaero.com) wrote:
: I have a small AVHRR system, and my apartment does not allow me
: enough room to catch all of the Georgia coast from a polar orbitors pass.
: I have software to work the raw HRPT data, and I am looking for a
: internet connection to near real time HRPT data for Georgia. I have
: found a station that does this for Hawaii, and some tiles for the West
: Coast.
: Has anyone located an internet connection for near real time HRPT
: data that covers Georgia? In advance, thank you very much!

: Ken
: ken_terry@macmail.eng.gulfaero.com

Please post it here. I would be interested in the West Coast areas (say out
to Hawaii). One dish on the house is enough, I can't add an AVHRR system.
:)

Rick

2044. Question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-05 06:47:07 UTC
From: sueling@course3.harvard.edu
Message-ID: <3bud1b$oqk@decaxp.harvard.edu>
Source record: 26195

I'm not exactly sure I'm posting to the right newsgroup, but I would
really appreciate any help with the following question. (I need the answer
for an assignment.)

What radio frequency would you have used to listen to the
Space Shuttle STS-64 mission?

Thanks

2045. APT-Satellites: Report DEC 03, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-12-05 09:43:21 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-051294104209@oskar.gmd.de>
Source record: 26197

```
Observed 50.61 deg NLat, 7.55 deg ELon; DEC 03, 1994

Following the satellite-name you read the approx.
hour (local=sun-time) and motion-direction of the
pass (N=northbound, S=southbound).
This time +/-1.5h is valid for the next 10+ days
to expect the satellite to be visible in range of
northern-hemisphere-stations, add 11h and switch
S<->N for another pass to observe.

NOAA-9 09:S APT 137.62 MHz On
NOAA-10 17:N APT 137.50 MHz *OFF*
NOAA-11 17:N APT 137.62 MHz AVHRR dead
NOAA-12 08:S APT 137.50 MHz On
Meteor 2-21 12:S APT 137.85 MHz On
Meteor 3-5 18:N APT 137.85 MHz *OFF*
OKEAN 1-7 11:N APT 137.40 MHz On (sometimes)

APT of OKEAN 1-7 was on during rev.# 785 southbound
before it was switched off over 60 deg N. NOAA-11
transmits synch-bursts but imaging is dead. NOAA-10
APT is off, satellite is in standby status due to TBUS.
Meteor 2-21 is active, but the signal remains weak.
No other APT-signal 137.00-137.99 MHz 07:00-20:00 UT.
3 days until launch of NOAA-J 06 DEC 1994 noon.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

2046. 95 STS Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 01:04:46 UTC
From: Dean Perriello <perriello@delphi.com>
Message-ID: <hcxUWsW.perriello@delphi.com>
Source record: 26199

I am looking for a 1995 space shuttle schedule. Anyone know where I could find it?

Dean Perriello N4TYS

2047. shuttle amateur frequencies - was Re: Question

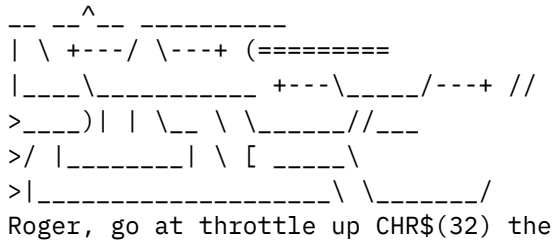
Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 03:42:39 UTC
From: Philip Chien <Pchien@ids.net>
Message-ID: <3c0mjf$6h8@paperboy.ids.net>
Source record: 26200

In article <3bud1b$oqk@decaxp.harvard.edu> Christopher Sue-Ling,
sueling@course3.harvard.edu writes:
>What radio frequency would you have used to listen to the
>Space Shuttle STS-64 mission?

Well, you'd have to go out about ten times the diameter of the solar
system to be able to catch up with the STS-64 mission because it landed a
couple of months ago ...

In any case, the SAREX (Shuttle Amateur Radio EXperiment), transmits on
145.55 Mhz. (FM) when it's in use. Different uplink frequencies are used
for different purposes and regions.

The next SAREX mission will be STS-67 in February 1995, with Ron Parise
WA4SIR and several other ham and non-ham astronauts.

Philip Chien, Earth News - space writer and consultant PCHIEN@IDS.NET

Roger, go at throttle up CHR$(32) the final frontier

2048. Pentium bug & satellite tracking?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 04:22:45 UTC
From: caver@acca.nmsu.edu
Message-ID: <3c0oul$o8h@dns1.NMSU.Edu>
Source record: 26202

I'm sure most of you are aware of the Pentium chip floating point division bug (or 'flaw' as Intel prefers to phrase it). If you don't know about the bug, go read comp.sys.intel for all you ever want to know.

My question to this group is, has anyone analyzed the impact of this chip problem on satellite tracking software? I'm particularly interested in its affect on programs like Instant Track from AMSAT. I'd be very interested in any views on this issue.

Thanks,
--
Tom Kindel NW5B, NSS 32152 E-Mail: caver@acca.nmsu.edu
Las Cruces, N.M.
******* "Modesty is for those who have no talent!" ******
-- Anon --

2049. Satellite equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 04:36:48 UTC
From: aelstien@wwa.com
Message-ID: <3c0pp0$htq@sashimi.wwa.com>
Source record: 26201
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.equipment

I would like to find out which equipment is the best to buy for amateur satellite work. I am interested in the differences between the ICOM 820, Yaesu 736r, and kenwood 790. Also , what additional equipment is required? Are there many dx stations using satellite during this poor sun spot cycle period?

ThaNKS, 73, aL eLSTIEN

2050. time of NOAA-J LAunch?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 05:06:51 UTC
From: cdn@netcom.com
Message-ID: <cdnD0DI7F.EDK@netcom.com>
Source record: 26203

Does anyone know what time the launch of NOAA-J is scheduled for?
I have heard it it December 6, in the early AM.

TIA

cdn

--

C. David Nusbaum cdn@netcom.com
Earth Imaging Systems Sacramento, CA
NOAA and Meteor Polar Environmental Satellite Imaging
NASA GAS Free Flyer World UV Imaging Design Team Lead

2051. SAREX help needed NOW!!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 06:40:03 UTC
From: lasernut@aol.com
Message-ID: <3c1103$dcf@newsbf01.news.aol.com>
Source record: 26204

I have been awarded the oppurtunity to participate in the Shuttle Amatuer Radio Experiment for the next shuttle flight but I have a major problem my operator that was initially going to handle the contacts can no longer participate and I need to find someone to handle it ASAP! Anyone in the Bradenton/Sarasota,FL area can you help me? Either by participating yourself or possibly put me in touch with someone localy. I really would like to make this happen, any help will be greatly appreciated. I need to know something by Tuesday afternoon 12/6/94 please send email or contact me by landline.

laser nut@aol.com
Greg Hughes
Technical Director
Bishop Planetarium
(813) 746-4131 ext21

2052. Re: Question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 17:44:59 UTC
From: geret@gov.nt.ca
Message-ID: <1994Dec6.174459.2276@gov.nt.ca>
Source record: 26206

In article <3bud1b$oqk@decaxp.harvard.edu> sueling@course3.harvard.edu (Christopher Sue-Ling) writes:
>I'm not exactly sure I'm posting to the right newsgroup, but I would
>really appreciate any help with the following question. (I need the answer
>for an assignment.)
>
>What radio frequency would you have used to listen to the
>Space Shuttle STS-64 mission?
>
>Thanks

All general traffic takes place on 145.55 MHz

2053. Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 19:58:31 UTC
From: rehm@slugbt.zso.dec.com
Message-ID: <3c2fp7$798@therag.zso.dec.com>
Source record: 26207

I'd like to build a simple solar receiver that would demonstrate
that the sun emits radio waves in addition to light and heat.

This project would be for use by 8th graders, and should
include a hand held (or camera-tripod mounted) directional
antenna. So, similar to turning your eyes or face away
from the sun (and it being less bright and less warm), I
would want the meter (or audio) indicator to decrease.

Further, it would be nice if the frequency used related to some
aspect of solar physics, i.e., some spectral line for H or He.

Finally, if possible, it would be nice to pick a frequency
at which reception could be correlated against some other
measure of solar activity (derived from WWV or some other
Internet-accessible solar report), so relative differences
in measurements across time could make sense.

I'm a home-brew QRP enthusiast with some radio astronomy experience,
so I would like to build this myself. Budget is $100 or so,
although if a general coverage Ham receiver could be used
with a down-converter, then the cost of the Ham receiver need
not be included.

Pointers to plans, schematics, books, helpers appreciated.

Thanks,

/eric rehm
KJ7AE
rehm@zso.dec.com

2054. Re: Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 22:29:01 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3c2ojd$9sv@cello.gina.calstate.edu>
Source record: 26208

Eric,

Although I don't have an answer to your question, your message caught my attention. My high school physics students will soon be choosing topics for their physics projects. I am trying to encourage them to collaborate with students at another school -- either by internet, packet radio or the microsatellites. If your kids get going on a solar physics project and they would like some high school "mentors" I think that would be a good experience for both groups of kids.

Last year, I had a group of students who tried to collect pulsar signals using Amsat's radio telescope in Colorado. They weren't successful but they learned a lot!

Good luck on you solar quest,

Bob Houghton KC6LVG

2055. Re: Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-06 22:29:23 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3c2ok3$9sv@cello.gina.calstate.edu>
Source record: 26209

Eric,

Although I don't have an answer to your question, your message caught my attention. My high school physics students will soon be choosing topics for their physics projects. I am trying to encourage them to collaborate with students at another school -- either by internet, packet radio or the microsatellites. If your kids get going on a solar physics project and they would like some high school "mentors" I think that would be a good experience for both groups of kids.

Last year, I had a group of students who tried to collect pulsar signals using Amsat's radio telescope in Colorado. They weren't successful but they learned a lot!

Good luck on your solar quest,

Bob Houghton KC6LVG

2056. Sound Blaster software on oak.oakland.edu - uploads.txt [1/1]

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 02:50:53 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3c37ud$ua@news.doit.wisc.edu>
Source record: 26210

I've just uploaded a bunch of sound blaster files to oak.oakland.edu.
They're currently in /pub/hamfiles/incoming but I'm sure they'll be moved
soon. Here's a list of the files:

APTCAP40.ZIP Capture weather sat photos with sound blaster card

FFTMORSE.ZIP Decode morse code with your sound blaster card.

MF12.ZIP Takes audio input from Sound Blaster card and displays
audio spectrum on computer monitor.

SBPSP11.ZIP Use your Sound Blaster card to receive weather photos
from NOAA weather satellites.

SBPMORSE.ZIP Decode morse code with your sound blaster card

SCOPTRAX.ZIP Real time audio oscilloscope for sound blaster.

SKY57A.ZIP SkyMap v 5.7 - a wonderful tool for VISUAL satellite
SKY57B.ZIP tracking. Draws "near publication quality" star maps
SKY57C.ZIP and plots satellite paths across them.

SLOWSC.ZIP Send and receive slow scan tv with your Sound Blaster card

SOP9445A.ZIP STS Orbit Plus. A BEAUTIFUL
SOP9445B.ZIP satellite tracking program. Draws earth globe and plots
SOP9445C.ZIP a satellite's path on it. Files A and B are the complete
set of files, U is an upgrade for those who are already
running an earlier version of the program.

2057. Mir is coming for Christmas! - chrismir.msg [1/1]

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 02:52:38 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3c381m$ua@news.doit.wisc.edu>
Source record: 26211

Just a heads up:

Mir begins a series of visible evening passes over North America this month. Most of us will have some excellent evening passes just before and after Christmas. Mir, the Space Shuttle and a couple of the "secret" recon satellites are the brightest objects in orbit. Mir looks like a very bright star moving across the sky. A typical pass is six to eight minutes long, from when you first see it until it disappears into the earth's shadow or fades out near the horizon.

I've found that people are VERY interested in knowing when and where to look to actually see Mir. I usually use tracking programs to look for good passes and plot them on star maps. Then I announce the times and where to look for the best passes on local 2-meter nets. We never fail to have several dozen people monitoring the repeater when pass time comes and everybody has a great time watching it. (And you can occasionally hear Mir on 145.55 while you watch it go over - an absolutely delightful experience!) You can hardly find a better way to introduce hams to hamsats.

If you'd like to try this, you'll need a tracking program that can calculate VISIBLE passes. To see a satellite, it not only has to be above your horizon, but the sun has to be down at your location while the satellite is still in sunlight above you. Most ham oriented tracking software only tells you when the satellite is above the horizon.

I normally use TrakSat 2.80 for most of my visual work. It shows orbits on a world map or on a star map. It can also output the data in text form (altitude, azimuth, range, etc) to a disk file. TrakSat 2.80 will work on XTs with Hercules monitors or better and if you have a slow computer you can let it chug away overnight, searching 30 days ahead and saving the results in a disk file you can read in the morning.

Once you've found a likely pass, it helps to plot Mir's path on a sky map. This lets you tell people things like, "Mir will pass through the bowl of the Big Dipper at 7:13 pm", which helps people find it.

If you decide to do this, I HIGHLY suggest you calculate and watch a few passes to get the hang of it before announcing it on the air. There are some pitfalls, such as a pass that looks great on paper, except that it's across the western sky and you're looking at the shadowed side of the space station, which makes it very dim and hard to see. Another problem is that Mir occasionally reboosts - fires its rockets to raise its orbit back up to where it should be. When

it does this, of course, your predictions are toast.

Another program is even better for finding visual passes if you can figure out its arcane menu structure. This is SkyMap and it plots "near publication quality" star maps and then plots the satellite's path across them. Once you figure out how to tell it to do so, that is. SkyMap also has a great search routine that finds future visible passes very quickly - again, if you can figure out how to do it.

Both programs are widely available on BBSes and can be found on the Clear Skies BBS in Madison, WI at (608) 249-7130. I've also just uploaded them to oak.oakland.edu. Look for these file names:

TrakSat: TRAK280A.ZIP, TRAK280B.ZIP
SkyMap: SKY57A.ZIP, SKY57B.ZIP, SKY57C.ZIP

If anybody has any questions, I'd be happy to help. Email me at djmullen@facstaff.wisc.edu.

Thanks and Merry Xmas,
Dave, N9LTD

2058. Re: SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 06:39:21 UTC
From: mdf@vigard.mef.org
Message-ID: <D0FH5M.685@vigard.mef.org>
Source record: 26212

lsn92@ecs.soton.ac.uk (L S Ng) writes:
>Ronald G. Parsons writes:
>>
>> > I am looking for SGP4/SDP4 Model of orbit determination implemented in C
>> > programming language. Look angles and range are required as output with
>> > the Two-line-elements set as initial input.
>>
>> I am looking for the same thing. If you get e-mail responses, please post
>> of forward them.
>
>Not much luck though. I don't think there is a completed C library for
>SGP4/SDP4 at the moment, although Dr. Telso who wrote the Fortran and
>Pascal library mentioned there was such a plan.

i have had some moderate success in the past using the f2c fortran->C
converter. the main difficulty was with the deep-space routines;
various floating point exceptions. due, i suspect (guessing from prior
experience with getting the NEC to work) float/double size mismatches.
i was working to fix those, but got (as usual) side-tracked.

unfortunately, the output of f2c isn't very maintainable. you'll have
to keep the original fortran around... and the fortran itself isn't
very amenable to making something that accepts a pointer to a structure
that defines the element set (and any needed pre-computations) and a
time and returns a position/velocity.

> Turbo Pascal does not generate Object codes which you can link with a
> C program!

are you sure about this? the stack order is different for Pascal function
calls (from what little i still remember of MSDOG programming -- weekly
shock therapy has still yet to remove the last remaining memories...)
but that can be handled in C with some kind of kludge.

>So the next best thing to do is to the compile Pascal SGP4/SDP4 library
>into binaries (.EXE or .COM) and put the SGP4/SDP4 binaries resident in
>memory. Create some interrupt hooks to the resident SGP4/SDP4 functions
>which can be called from another (C or others) program.

... hair standing on end ...

>This is just what I plan to do with it.

or you can use Linux and retain some sanity. :-)
--
Matthew Francey | "Live before you die."
mdf@vigard.mef.org | GPS(NAD27): N43o34.210' W079o34.563' +0093m

2059. Re: Pentium bug & satellite tracking?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 17:31:04 UTC
From: jimkelly@astro.ocis.temple.edu
Message-ID: <3c4rgo$o6@cronkite.ocis.temple.edu>
Source record: 26213

Tom Kindel (caver@acca.nmsu.edu) wrote:

: My question to this group is, has anyone analyzed the impact of this chip
: problem on satellite tracking software? I'm particularly interested in
: its affect on programs like Instant Track from AMSAT. I'd be very
: interested in any views on this issue.

As an owner of a defective 60 Mhz Pentium, I'd like to know also!

I'm a political scientist and running statistical analysis software
such as SPSS for windows is problematic on these defective chips,
according to SPSS.

I'll bet IT trips over the bug also!

Jim, KK3K
--
Jim Kelly, Amateur Radio Licensee KK3K (jimkelly@astro.ocis.temple.edu)
M.A. Candidate - Political Science - Temple University \
Member - Lambda Amateur Radio Club for Sexual Minorities \
Standard Disclaimers Apply - LARC info: (216) 556 - 1642 / \
*** / \

2060. Setting Time via NBS in Instant-Track Software

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 19:27:17 UTC
From: ys@isr.harvard.edu
Message-ID: <3c52al$nss@decaxp.harvard.edu>
Source record: 26216

Hi, I have a quick question about Instant-Track software. I would like to set time via NBS. Because the PC of our radio club uses comm port 2, I need to specify it in NBSCOM.INI file. Unfortunately somebody at our club deleted that file, I guess. The document does not really tell how to specify the comm port in this file. I am using version 1.00, and would very much appreciate it if anybody can help me out about how to set up NBSCOM.INI file. Thanks.

73, Yuzuru Suzuki, AA1JA (e-mail: ys@isr.harvard.edu)

2061. Re: Satellite equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 19:41:20 UTC
From: luca@napoleon.stortek.com
Message-ID: <D0GHCw.5An@stortek.com>
Source record: 26214

In article <3c0pp0$htq@sashimi.wwa.com>,
Allan D. Elstien <aelstien@wwa.com> wrote:
>I would like to find out which equipment is the best to buy for amateur
>satellite work. I am interested in the differences between the ICOM 820,
>Yaesu 736r, and kenwood 790. Also , what additional equipment is
>required? Are there many dx stations using satellite during this poor sun
>spot cycle period?
>
>ThaNKS, 73, aL eLSTIEN
>
ICOM 820, Yaesu 736r, and kenwood 790
^ most difficult to use , high power ~ 35-40 W SSB
^ many bands (4) only 25W
^ extremely expensive

You will also need a uhf power amp and a preamp.
73's
Luca
--
Just say no to summer. Ski all year !
Network Engineer, Storage Technology Corporation - Louisville, CO
luca@napoleon.stortek.com | VE2WKR/W0 | Phone x17619

2062. Re: SGP4/SDP4 C Library

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 20:51:37 UTC
From: aranders@kosepc01.delcoelect.com
Message-ID: <3c578p$9fb@kocrsv08.delcoelect.com>
Source record: 26215

In article <3286.9411301531@monet.ecs.soton.ac.uk>, L S Ng complains:
>
> So the next best thing is to call the Pascal function from a C program.
>
> There is a glitch (in Pascal to C interfacing) which I just found, and
> it is quite a big one actually:
>
> Turbo Pascal does not generate Object codes which you can link with a
> C program!

In <lNZukClgnMw5055yn@helix.net>, gkennedy@helix.net (Geoff L. Kennedy) claims:
>
> Sure you can !! You should be able to declare them using this
>format:
>
> extern pascal function(args);
>
> (Disclaimer: I haven't personally tried it....just read the Borland
>C++ Programmer's Guide....)

You've been saved from half of a horrible flaming by your disclaimer!

You are indeed correct that Borland compilers can link to Pascal
functions in external .obj files using appropriate syntax.
The problem is that Turbo Pascal doesn't create .obj files.
The original complaint made that pretty clear. Here's the other half
of the flame: Read before you write.

--
Alan Anderson .-- -... ----. .-. ..- ..-. | Ignorance can be fixed,
(I speak AT, not FOR, Delco Electronics) | but stupidity is permanent.

2063. Re: time of NOAA-J LAunch?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-07 22:39:37 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D0GpM1.98y@netcom.com>
Source record: 26218

C. David Nusbaum (cdn@netcom.com) wrote:
: Does anyone know what time the launch of NOAA-J is scheduled for?
: I have heard it it December 6, in the early AM.

NOAA-J launch was scrubbed Dec 7th and rescheduled for Dec 12th; launch time somewhere around 10:00 a.m.

Bill Eareckson
eareckso@netcom.com

2064. NOAA J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 04:21:17 UTC
From: roffer@rcf.rsmas.miami.edu
Message-ID: <3c61jt$gja@umigw.miami.edu>
Source record: 26217

It my understanding that NOAA J will be launched 12 Dec 94 at 5am
eastern time. Launch is from Vand. California (sorry about eastern time).
Delays today due to weather

Regards
Mitch Roffer
Roffer@rcf.rsmas.miami.edu

2065. Re: Satellite equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 04:26:49 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3c61ua$qqh@cello.gina.calstate.edu>
Source record: 26219
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.equipment

I am wondering the same thing. I was at HRO today and the 820H is $100 cheaper than the FT-736R. I use an FT-736R at school and I like the radio although some functions are far from intuitive. I still don't like the way the memories work. This radio has more features than the Icom but its older design (as reflected in no 9600 baud) is its biggest disadvantage.

I am tempted to buy the Icom beacuse of its advertised 9600 bps "plug and play" and its smaller size. I don't want to shell out my cash until iv'e heard from some users. I am primarily interested in working the microsats, both 9600 bps fm and 1200 PSK. Although the Yeasu will do 9600 after mods, the thought of paying almost $2k for a radio and then wiggling capacitors until they break off and the like doesn't appeal to me.

If anyone reading this is using any of the three radios mentioned above, I'd love to hear what you like / dislike about your radio as well as your other equipment and modes that you work.

Bob Houghton KC6LVG
Science Department Chairman
John A. Rowland High School
Rowland Heights, California
Robert D. Houghton
Science Department Chairman
John A. Rowland High School
Rowland Heights, CA 91748
Also: rdhoughton@vms4.sci.csupomona.edu

2066. Re: time of NOAA-J LAunch?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 06:45:28 UTC
From: gkennedy@helix.net
Message-ID: <ApdvkClgnwM3073yn@helix.net>
Source record: 26222

In article <cdnD0DI7F.EDK@netcom.com>, cdn@netcom.com (C. David Nusbaum) wrote:

> Does anyone know what time the launch of NOAA-J is scheduled for?
> I have heard it it December 6, in the early AM.

It has been delayed until Dec. 12 at 10:02 UTC (05:02 EST, 02:02 PST).

The launch on Dec. 6 was scrubbed due to a faulty ignighter in the
Atlas launch vehicle, and the re-scheduled launch on Dec. 7 was scrubbed
due to high winds.

Gives me an excuse to work on my antenna system <GRIN>......

****
* Geoff L. Kennedy ** Located on the WE[s]T Coast of *
* "Kennedy's Space Centre" 8-) ** Beautiful British Columbia ! *
* E-mail: gkennedy@helix.net ** Coquitlam, BC, Canada *
****

2067. Re: Pentium bug & satellite tracking?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 11:23:53 UTC
From: jcarter@orl.mmc.com
Message-ID: <3c6qc9$oe3@theopolis.orl.mmc.com>
Source record: 26220

In article o6@cronkite.ocis.temple.edu, jimkelly@astro.ocis.temple.edu (James L. Kelly) writes:

/: My question to this group is, has anyone analyzed the impact of this chip
/: problem on satellite tracking software? I'm particularly interested in
/: its affect on programs like Instant Track from AMSAT. I'd be very
/: interested in any views on this issue.
/
/As an owner of a defective 60 Mhz Pentium, I'd like to know also!
/
/I'm a political scientist and running statistical analysis software
/such as SPSS for windows is problematic on these defective chips,
/according to SPSS.
/
/
/I'll bet IT trips over the bug also!

Hey guys here is a test that will uncover the bug if you have it:
This test is from Information World Nov 28, 1994 and was used
in Excell spreadsheet but others should give the same results!

Pentium 486

1.Take this number 4195835 4195835
2.Multiplied by 3145727 3145727
3.Divide by 3145727 3145727

4.Your answer 4195579 4195835

Good Luck with the test

Jim

\/\/ * \/ _._. __._ /\/\/ | James A. Carter (Jim) | jcarter@orl.mmc.com |
/|\ | Senior Software Engineer |_____|
/\|/\ K D 4 P O N | Martin Marietta | These views are my own |
/\/|\/\ ORLANDO | Mail Point 138 | and not that of my |
/\/\|/\/\ FLORIDA USA | 5600 Sand Lake Road | employer. |
/\/\/|\/\/_____| Orlando, FL 32819-8907 |_____73's_Jim ____|

2068. Re: Pentium bug & satellite tracking?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 13:34:19 UTC
From: jimkelly@astro.ocis.temple.edu
Message-ID: <3c720r$al8@cronkite.ocis.temple.edu>
Source record: 26221

James Carter (jcarter@orl.mmc.com) wrote:

: Hey guys here is a test that will uncover the bug if you have it:

There is a short test program called "p87test" that is available on the
comp.sys.intel newsgroup, or by ftp, that will evaluate your pentium
chip. I ran the program on my machine last night. Here's the output
of the program:

Pentium FDIV bug finder. (c) Terje Mathisen 1994

This is a Pentium or better cpu

CPUID reports back:
Vendor id = "GenuineIntel"
Family (4=486, 5=Pentium etc.) = 05, stepping = 05, model = 01

CPU feature list:
1 : FPU (NDP) onchip
2 : Virtual 86 Mode Extensions
4 : I/O Breakpoints
8 : Page Size Extensions
10 : Time Stamp Counter
20 : Pentium stype MSRs
80 : Machine Check Exception
100 : CMPXCHG8B instruction available
It has a 387 or later ndp

It has the FDIV bug:
(1.0/824633702449.0)*824633702449.0 is not equal to 1.0!

(end)

Intel has promised me a replacement chip. When? Who knows!

73,

Jim, KK3K

--
Jim Kelly, Amateur Radio Licensee KK3K (jimkelly@astro.ocis.temple.edu)
M.A. Candidate - Political Science - Temple University \
Member - Lambda Amateur Radio Club for Sexual Minorities \
Standard Disclaimers Apply - LARC info: (216) 556 - 1642 / \
*** / \

2069. IC820H

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 14:33:21 UTC
From: dec@netnet.net
Message-ID: <3c75fh$1du@netnet2.netnet.net>
Source record: 26223

Before you go buying this radio thinking that it is 9600 ready, please download

the review by James Miller, G3RUH, that was recently published in the amsat
journal entitled: "Review of a 9600 Baud ready radio -that isn't"
from
ftp.amsat.org (192.35.156.5)
/amsat/articles/g3ruh/a103.zip

73
dec@netnet.net

2070. Kansas City Tracker

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 15:05:36 UTC
From: Chris Oesterling <chris@angus.mystery.com>
Message-ID: <24s1wc1w165w@angus.mystery.com>
Source record: 26224

Hi, I have KCT software version 2.40 dated July 23, 1990. I'd like to get
the lastest and greatest if available. Does any nice person have their
phone number (the documention doesn't list it.) Thanks! - Chris

--
Chris Oesterling (chris@angus.mystery.com)
Mystery Spot BBS, Royal Oak, MI --?--

2071. pctrk304.zip - 3D Earth satellite orbit visualization package

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 18:21:04 UTC
From: 71371.1257@CompuServe.COM
Message-ID: <9412081821.kp16322@SimTel.Coast.NET>
Source record: 26225
Cross-posted to: comp.archives.msdos.announce,rec.radio.amateur.space

I have uploaded to SimTel, the Coast to Coast Software Repository (tm),
(available by anonymous ftp from the primary mirror site OAK.Oakland.Edu
and its mirrors):

SimTel/msdos/satelite/
pctrk304.zip 3D Earth satellite orbit visualization package

PC-TRACK 3.0 is a 3D object-oriented, windowed package for the
visualization of earth orbiting satellites. Computes and displays
position information for up to 200 satellites simultaneously on either 3D
ECF projections, or a Mercator projection of the world. Shows satellite
footprints, lines of sight between site and vehicles, satellite and
sub-satellite positions, as well as solar position. Displays look angle
data in graphical and chart form.

PC-Track has an integrated mutual visibility pass scan capability for
finding future in-range passes simultaneously visible to one or two
sites. Finds illuminated satellite passes for times of interest.

Text mode tracking computes satellite position, doppler shifted
frequencies, orbit phase, range and range rates, and look angles for
two sites simultaneously, as well as solar illumination data.

PC-TRACK 3.0 has the capability of saving all operating parameters
(active satellites, and satellites, graphics views, display modes,
colors, etc.) in separate parameter files. This permits the user to
build many different track scenarios, each quickly loaded from the
program. Four sample parameter files are provided: AMATEUR, WEATHER,
GPS, and DEFAULT.

PC-TRACK 3.0 is capable of importing data from NORAD Two-Line element
files, AMSAT element files, and OBJECTS.DAT and OBSERVER.DAT files from
earlier versions of PC-TRACK.

PC-TRACK 3.0 runs in DOS protected mode to take advantage of up to 16 MB
of system RAM. (NO 640K BARRIER!)

Program Requirements:
80386, 80486, (&Pentium?) CPU (80387. recommended. not reqd).
2-16 MB
3 MB Disk space
DOS 5.0 or later.

PC-TRACK is ShareWare, registration required. Registrations by Visa & MC
now possible via FAX. Corporate/Government POs welcome.

Program Limitations: Distribution versions comes with four globe views. Registered users receive MAPGEN, a graphical globe view generation utility which allows generation of an unlimited number of user defined views. User can define viewpoint, offset, scale, attributes (such as geographic features), and colors for each view.

Changes: Program and documentation reflect authors new address and phone; new registration options (VISA/MC, FAX orders, Email orders, etc.); updated CPU platforms, several bug fixes and typo corrections.

pctrk304.zip has replaced pctrk30b.zip and pctrk30a.zip.

Uploaded by the author.

Thomas Johnson
71371.1257@CompuServe.COM

2072. Re: Satellite equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 20:38:33 UTC
From: Gerald Schmitt <ggs@aerie.lanl.gov>
Message-ID: <3c7rjj$kut@newshost.lanl.gov>
Source record: 26226
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.equipment

I use the 736r and it seems to be the workhorse of the satellite
crowd. It is quite an easy and intuitive radio to use. I guess I
don't understand your comment about the memories. You might not
know a trick that is not documented in the English manual.
To load a memory to a VFO without affecting the memory, as it
would be if you did a memory exchange, you do the following.
Select the appropriate more ie satellite reverse or normal.
Press MR, select the memory you want to load to VFO. Then you
press the FN key and then the VFO key. The memory contents
are loaded into the VFO and the memory is not affected. I have
my OSCAR memories set up to tune up. My frequencies are in the
CW bandpass and transmit is set to CW receive to USB. Thus all
I have to do is turn on the VOX and tune the transmit frequency
till I can hear my CW on the downlink. Actually I leave the satellite
selector switch in the transmit position during the memory VFO loading
process as saving one step. I can be loaded and tuned in seconds.
Usually I am ready before the KCT has positioned the antennas.
The big advantage of the 736r is the two modules you can add. I like
to work 6 meters when there is not a satellite window. The Icom is
smaller if that matters to you. The 9600 is a non-issue. The mods to
the 736r are easy but you should also change the IF filter. I am
currently trying a IC-281H for the 9600 birds and I will post my
success or lack of same. Good luck 73 de Jerry

2073. What happen to the weekly Keps?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 21:36:37 UTC
From: kb8nw@barf80.nshore.org
Message-ID: <q8a2wc1w165w@barf80.nshore.org>
Source record: 26227

I have not seen the Keps on here and rec.radio.amateur.misc
for about a month. What happen to them?

Tedd Mirgliotta KB8NW
InterNet: kb8nw@barf80.nshore.org
Basic Amateur Radio Frequency BBS (BARF-80) +1 216/237-8208
"Totally devoted to Amateur Radio" - 24 Hrs a day 8/N/1 14.4k-300 baud

2074. Re: Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-08 22:46:19 UTC
From: mike_ray@cix.compulink.co.uk
Message-ID: <D0IKL7.6rH@cix.compulink.co.uk>
Source record: 26228

Hi Eric, about building a solar radio receiver. I don't know what frequencies you would need to listen to to hear Hydrogen or other emissions but as a UK amateur who does a bit of Moon bounce I have done some reading about radio astronomy. You would find it hard to hear much solar noise on a VHF receiver with only a small antenna unless there was a lot of activity at the time.

The easiest and cheapest way to hear a significant amount of noise would be to use a VHF converter in conjunction with an HF receiver and build a 'Dicke' system. This is where you subtract the receiver noise by connecting two antennas to the receiver via a phase shift switch. The two antennas, which only need be small, like a dipole or perhaps a dipole with one reflector behind, have their cables combined. As the noise source (the Sun) is moving with respect to the antennas the signals received by the antennas will alternately combine and cancel as the distance from the Sun changes by half a wavelength. If you now introduce the phase switch which effectively switches in and out another half wavelength of cable into the feed from one of the antennas every 0.001 of a second (easier than it sounds). You also reverse the polarity of the output from the detector at the same rate. Bingo, you've removed the receiver noise completely.

As the noise from the receiver is likely to be something like 300 times as loud as quiet Sun the amount of noise you will get from doing this is VERY significantly greater than you can with just a small antenna and a straight forward receiver.

In summary you would need: A VHF down converter to plug into an HF receiver, the ability to get at the detector circuit in the receiver, should not be difficult for a QRPer, and two small antennas. The phase shift switch is very easy to build, just a handful of components, including the square wave generator to do the 0.001 second switching.

To get results you may need to wait and see what difference in noise you get as the Sun comes round from East to West passing through the beam width of the antennas, or you could switch out both antennas and switch in a 50 Ohm resistor on each end to get a 'cold sky' reference.

I don't know much about the subject and this is just stuff I've read and fiddled about with while I've been dabbling with VHF Moon bounce.

Need to talk more then mail me: mike_ray@cix.compulink.co.uk

My call sign is G4XBF.

73, Mike

2075. Re: Kansas City Tracker

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 00:40:24 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.62.0000AC6B@teleport.com>
Source record: 26231

In article <24s1wc1w165w@angus.mystery.com> Chris Oesterling <chris@angus.mystery.com>
writes:
>From: Chris Oesterling <chris@angus.mystery.com>
>Subject: Kansas City Tracker
>Date: Thu, 8 Dec 1994 15:05:36 GMT

>Hi, I have KCT software version 2.40 dated July 23, 1990. I'd like to get
>the lastest and greatest if available. Does any nice person have their
>phone number (the documention doesn't list it.) Thanks! - Chris

That is the latest version available from LL Grace. There is another floating
around, which was authored by someone else.

The latest greatest, though, is the Windows KCT Driver by David Hoatson. If
your computer has Windows, this and Wisp is the way to go by far!

Bill, n7ryw@teleport.com

2076. Re: Setting Time via NBS in Instant-Track Software

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 00:44:04 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.63.0000BC13@teleport.com>
Source record: 26229

In article <3c52al$nss@decaxp.harvard.edu> ys@isr.harvard.edu (Yuzuru Suzuki) writes:
>From: ys@isr.harvard.edu (Yuzuru Suzuki)
>Subject: Setting Time via NBS in Instant-Track Software
>Date: 7 Dec 1994 19:27:17 GMT

>Hi, I have a quick question about Instant-Track software. I would
>like to set time via NBS. Because the PC of our radio club uses
>comm port 2, I need to specify it in NBSCOM.INI file. Unfortunately
>somebody at our club deleted that file, I guess. <etc. etc.>

Here is what is in the version I have:

```
# This file contains parameters which control how we dial up the NBS ACTS
# The dial and hangup commands are the exact character strings we will use
# to make the modem dial and hangup. You may customize these for your
# modem. port tells us which serial port to use. 0 is COM1, etc.
# maxtime sets the maximum time (seconds) for a phone call.
#
#
port = 0
baud = 1200
dial = ATDT1-303-494-4774
hangup = ATH
maxtime = 0
```

This should do it for you!
Bill, n7ryw@teleport.com

2077. Re: What happen to the weekly Keps?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 00:45:47 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.64.0000C36C@teleport.com>
Source record: 26230

In article <q8a2wc1w165w@barf80.nshore.org> kb8nw@barf80.nshore.org (Tedd Mirgliotta) writes:
>From: kb8nw@barf80.nshore.org (Tedd Mirgliotta)
>Subject: What happen to the weekly Keps?
>Date: Thu, 08 Dec 94 16:36:37 EST

>I have not seen the Keps on here and rec.radio.amateur.misc
>for about a month. What happen to them?

The best newsgroup source is:
sci.space.news
TSKelso posts there weekly, and his are the best.
Bill, n7ryw@teleport.com

2078. Re: APRS via satellite?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 11:56:06 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.68.000BEFBD@teleport.com>
Source record: 26234

In article <3c9pvr$b54@locutus.Bethany.ORG> pete@freenet.grfn.org (Pete Hoffswell) writes:
>From: pete@freenet.grfn.org (Pete Hoffswell)
>Subject: APRS via satellite?
>Date: 9 Dec 1994 14:35:39 GMT

>Does anyone know of a satellite that transmits/retransmits APRS type
>signals (Automatic Packet Reporting System)?

It is possible to do it through AO-27, but not many would appreciate the packet use of the FM repeater here. APRS was originally supposed to be useable through sats, but it has not been implemented for the Pacsats, which use a very good store and forward BBS system that is very much advanced from the current ground-bound systems. I am hoping to find a way to do an APRS-like system through the Pacsats in the future for a trip to Hawaii, but so far nothing.

>I'm messing around with APRS, but never hear anyone.. Guess I should
>just go to HF.

For now, yes.
Bill, n7ryw@teleport.com

2079. Re: Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 14:06:00 UTC
From: hudakjm@mcmaster.ca
Message-ID: <hudakjm.8.000E1A05@mcmaster.ca>
Source record: 26235

Try contacting the Society of Amateur Radio Astronomers :

S.A.R.A.
Hal Braschwitz
3623 W 139th. St.
Cleveland, OH 44111

BBS (608) 835-9605

http://IRsociety.com/0c:/sara.htm|/

2080. APRS via satellite?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 14:35:39 UTC
From: pete@freenet.grfn.org
Message-ID: <3c9pvr$b54@locutus.Bethany.ORG>
Source record: 26232

Does anyone know of a satellite that transmits/retransmits APRS type
signals (Automatic Packet Reporting System)?

I'm messing around with APRS, but never hear anyone.. Guess I should
just go to HF.

```
--
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
Pete Hoffswell |pete@grfn.org |616-336-2304
Holland, Michigan |N9SSA |http://www.grfn.org/~pete
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
```

2081. Re: HRPT Data for Georgia Coast?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-09 19:38:17 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <3cabn9INNlqg@gulfaero.com>
Source record: 26233

>Please post it here. I would be interested in the West Coast areas
>(say out to Hawaii). One dish on the house is enough, I can't add an
>AVHRR system.

Not to mention the expense!!!!!!!!!

For further information, please send e-mail to sat_lab@soest.hawaii.edu

2082. Re: APRS via satellite?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 00:13:13 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3carqp$ljn@news.doit.wisc.edu>
Source record: 26236

In article <3c9pvr$b54@locutus.Bethany.ORG>, pete@freenet.grfn.org (Pete Hoffswell) says:
>
>Does anyone know of a satellite that transmits/retransmits APRS type
>signals (Automatic Packet Reporting System)?
>
>I'm messing around with APRS, but never hear anyone.. Guess I should
>just go to HF.

The original APRS documentation suggests beaconing your APRS data
through Mir's TNC on 145.55 MHz. I've never seen anybody try this,
but it sounds like fun.

Dave, N9LTD

2083. Has anyone heard Mir lately?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 00:17:59 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3cas3n$ljn@news.doit.wisc.edu>
Source record: 26237

The Subject pretty well tells the story. Has anybody hear anything
from Mir lately? I had a chance to listen a few nights ago and
never heard a peep on five passes. Anybody have better luck?

Dave, N9LTD

2084. Re: Has anyone heard Mir lately?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 03:03:57 UTC
From: rr03@nyssa.swt.edu
Message-ID: <3cb5qt$c0t@central.server.swt.edu>
Source record: 26238

In article <3cas3n$ljn@news.doit.wisc.edu>, djmullen@facstaff.wisc.edu (Dave Mullenix) writes:
>The Subject pretty well tells the story. Has anybody hear anything
>from Mir lately? I had a chance to listen a few nights ago and
>never heard a peep on five passes. Anybody have better luck?

Wednesday morning pass, December 7, 07:35 CST, Mir packet loud and clear.
Wednesday evening pass, December 7, 22:34 CST, Mir silent
Thursday morning pass, December 8, 08:17 CST, Mir silent

Haven't had a chance to listen for it today (Friday).

Ryan Rudnicki
rr03@academia.swt.edu

2085. Trade FT-2200 for All moder

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 03:29:24 UTC
From: jls@capedata.iii.net
Message-ID: <3cb7b7$8tq@nic.iii.net>
Source record: 26239

I am interested in trading a Yeasu Ft-2200, six months old for an
all moder that I may operate at sea. Anyone interested?

Jeffery Stutzman
Packet: N1LUY@KQ1K.MA.USA.NA
Buzzards Bay, Ma.
MANU TENERE MARE SUPREMUS

2086. Best multi mode dual band for satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 10:54:58 UTC
From: billv@olympus.net
Message-ID: <billv.124.000AEADB@olympus.net>
Source record: 26243

Just checking. What is the best mmdb rig for satellite comms I am leaning towards the new icom has anyone used this puppy yet?

2087. Recommendations on HRPT Station Equiptment?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 15:05:36 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <3ccg40INNoc1@gulfaero.com>
Source record: 26240

I am looking at the Time Step HRPT station (sold through Spectrum International), and Quorum. I need all external boards, and be able to send pre-recorded DAT tape data into the decoder board after the satellite pass (seperate receiver/decoder). Due to building restrictions I am hoping to get by with a Yagi antenna?

Any advice on what works best here would be GREATLY appreciated. I am trying to catch HRPT data from 31N to 33N, a fairly small area. In advance, thank you very much for your time!

Ken
ken_terry@macmail.eng.gulfaero.com

2088. Re: Satellite equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 15:32:57 UTC
From: James W Chandler III <jwc@crl.com>
Message-ID: <3cchn9$j97@nntp.crl.com>
Source record: 26241
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.equipment

> I am wondering the same thing. I was at HRO today and the 820H is $100
> cheaper than the FT-736R. I use an FT-736R at school and I like the
> radio although some functions are far from intuitive. I still don't like
> the way the memories work. This radio has more features than the Icom but
> its older design (as reflected in no 9600 baud) is its biggest
> disadvantage.
>
> I am tempted to buy the Icom beacuse of its advertised 9600 bps "plug and
> play" and its smaller size. I don't want to shell out my cash until iv'e
> heard from some users. I am primarily interested in working the
> microsats, both 9600 bps fm and 1200 PSK. Although the Yeasu will do
> 9600 after mods, the thought of paying almost $2k for a radio and then
> wiggling capacitors until they break off and the like doesn't appeal to
> me.
>

G3RUH wrote an article about the 820 but I have not as yet read it. You can get
it from ftp.amsat.org in the amsat/articles/g3ruh directory. It is a103.zip.

I remember reading somewhere that the 820 was not exactly 9600
plug and play, but I don't remember where. If you have trouble getting the article
above, then let me know and I will mail it to you.

2089. WISP with SASI SatTracker

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 15:50:50 UTC
From: rubenc@iglou.iglou.com
Message-ID: <D0Lqou.Cxw@iglou.com>
Source record: 26242

Is anyone working on a driver for the SASI SatTracker & Frequency Manager to work with WISP? I have that setup because its the only one that supports the Icom 820H so far. I can use ORBITDRV to run it, but when I make a batch file that first goes to ITRACK to run the rotor and radio, then to WISP, WISP immediately EXITS back to windows. Any suggestions? Or maybe some one HAS written a driver?

Charlie KB8BWE
rubenc@iglou.com

2090. ARLK054 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-10 18:14:51 UTC
From: w1aw@arrl.org
Message-ID: <$arlk054.1994@ampr.org>
Source record: 26244
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK054
ARLK054 Keplerian data

ZCZC SK22
QST de W1AW
Keplerian Bulletin 54 ARLK054
From ARRL Headquarters
Newington, CT December 10, 1994
To all radio amateurs

SB KEP ARL ARLK054
ARLK054 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94328.80346848 -.00000090 00000-0 10000-3 0 3288
2 14129 26.7355 296.4176 6023898 230.1525 59.2733 2.05880748 58123
RS-10/11
1 18129U 87054A 94339.11467096 .00000032 00000-0 18634-4 0 9954
2 18129 82.9253 202.5013 0010335 273.3787 86.6186 13.72345211373359
UO-11
1 14781U 84021B 94340.05398557 .00000198 00000-0 41353-4 0 7589
2 14781 97.7815 346.7034 0012984 79.5633 280.7031 14.69279728575546
RS-12/13
1 21089U 91007A 94337.25003749 .00000051 00000-0 37934-4 0 7582
2 21089 82.9222 246.0610 0029983 0.9560 359.1648 13.74050867191869
AO-13
1 19216U 88051B 94333.70699234 -.00000472 00000-0 10000-4 0 9970
2 19216 57.6540 217.5974 7247486 355.9625 0.6416 2.09726205 17981
UO-14
1 20437U 90005B 94338.26943105 .00000022 00000-0 25370-4 0 577
2 20437 98.5835 60.6695 0011892 53.4486 306.7786 14.29866118253899
AO-16
1 20439U 90005D 94338.24860431 .00000008 00000-0 19982-4 0 8559
2 20439 98.5927 62.0707 0012248 52.9849 307.2445 14.29919969253909
DO-17
1 20440U 90005E 94338.25628497 .00000016 00000-0 23097-4 0 8568
2 20440 98.5940 62.4634 0012372 52.4590 307.7711 14.30060436253926
```

```
WO-18
1 20441U 90005F 94338.23473232 .00000017 00000-0 23327-4 0 8592
2 20441 98.5927 62.4282 0012930 52.8907 307.3455 14.30033356253929
LO-19
1 20442U 90005G 94338.27129455 .00000024 00000-0 26328-4 0 8550
2 20442 98.5946 62.7670 0013195 52.3994 307.8381 14.30132360253940
FO-20
1 20480U 90013C 94338.80415905 -.00000056 00000-0 -45938-4 0 7529
2 20480 99.0635 98.5992 0540537 313.2398 42.4758 12.83227956226019
AO-21
1 21087U 91006A 94337.49406880 .00000093 00000-0 82657-4 0 5449
2 21087 82.9429 17.4150 0035300 334.5810 25.3609 13.74547923192841
UO-22
1 21575U 91050B 94338.17947503 .00000041 00000-0 28241-4 0 5619
2 21575 98.4203 49.1024 0007903 136.1330 224.0487 14.36946765177490
KO-23
1 22077U 92052B 94338.04778060 -.00000037 00000-0 10000-3 0 4546
2 22077 66.0825 284.3379 0014788 246.4057 113.5404 12.86289507108633
KO-25
1 22828U 93061F 94338.69463345 .00000019 00000-0 25225-4 0 3307
2 22828 98.6359 52.7478 0011116 58.9651 301.2615 14.28077886 30115
IO-26
1 22826U 93061D 94338.72342948 .00000021 00000-0 26273-4 0 3514
2 22826 98.6395 52.7513 0010110 71.1912 289.0363 14.27750020 62028
AO-27
1 22825U 93061C 94338.19426940 .00000002 00000-0 18415-4 0 3539
2 22825 98.6386 52.1637 0009581 71.1477 289.0739 14.27643610 61947
PO-28
1 22829U 93061G 94338.70321596 .00000027 00000-0 28411-4 0 3456
2 22829 98.6365 52.7773 0011036 58.8053 301.4203 14.28053758 62030
Mir
1 16609U 86017A 94339.23503712 .00005895 00000-0 83274-4 0 8607
2 16609 51.6493 50.0286 0002632 344.1834 15.9076 15.58130919502673

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
December 13, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

2091. Re: Best multi mode dual band for satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 01:05:47 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.71.000118BE@teleport.com>
Source record: 26246

In article <billv.124.000AEADB@olympus.net> billv@olympus.net (Bill Vaughn) writes:
>From: billv@olympus.net (Bill Vaughn)
>Subject: Best multi mode dual band for satellites?
>Date: Sat, 10 Dec 1994 10:54:58

>Just checking. What is the best mmdb rig for satellite comms I am leaning
>towards the new icom has anyone used this puppy yet?

I have, and I am not thrilled at all. For the money, the FT-736R is still a far better buy. It is only about $100.00, but it includes an onboard power supply, so the costs are actually even.

The Icom boasts 9600 capability, but this does not work for satellite use. They made it with two receivers, and the one that the satellite mode uses does not have the 9600 capability.

On voice sats, I have found that fine tuning is a real pain. A button must be held down while tuning, and if you are transmitting at the time and tuning your uplink, you need three hands.

As a satellite rig, it was not well thought out. I bought it because I will be using it on my boat for 1200 baud pacsats, and I could not find the room for the 736s larger footprint. I sure wish I could have!

See-Ya-Bye!
Bill, n7ryw@teleport.com

2092. Re: IC820H

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 01:09:40 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.72.0001294C@teleport.com>
Source record: 26247

In article <9412110429.AA02877@nebula.tbe.com> dkelly@nebula.tbe.COM (david kelly) writes:
>From: dkelly@nebula.tbe.COM (david kelly)
>Subject: Re: IC820H
>Date: 11 Dec 94 04:29:06 GMT

>> Before you go buying this radio thinking that it is 9600 ready, please
>download
>>
>> the review by James Miller, G3RUH, that was recently published in the amsat
>> journal entitled: "Review of a 9600 Baud ready radio -that isn't"
>> from
>> ftp.amsat.org (192.35.156.5)
>> /amsat/articles/g3ruh/a103.zip
<etc. etc.>

>Worst gripe about the IC-820? It didn't come with a microphone. Now Icom is
>running a promotional for Christmas where they ship an external vox. Wonder
>if you still have to provide your own mic?

Yes, you do. FYI, the 736 has VOX built in, and the controls are on the front,
not buried in the back of the radio. Is anyone alive at Icom???

2093. Re: IC820H

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 04:29:06 UTC
From: dkelly@nebula.tbe.COM
Message-ID: <9412110429.AA02877@nebula.tbe.com>
Source record: 26245

> Before you go buying this radio thinking that it is 9600 ready, please
download
>
> the review by James Miller, G3RUH, that was recently published in the amsat
> journal entitled: "Review of a 9600 Baud ready radio -that isn't"
> from
> ftp.amsat.org (192.35.156.5)
> /amsat/articles/g3ruh/a103.zip
>
> 73
> dec@netnet.net

The above message is woefully incomplete and misleading. G3RUH's review can be summarized 1) Icom's selling the IC-820 to the satellite crowd where the Yaesu 736 dominates and the IC-820 is not a Yaesu clone, and 2) the IC-820 is one of the best packet performers for single band use, out of the box it does not operate split UHF/VHF via the rear panel accessory jack.

Icom could stand to learn a few things about user interfaces. On the other hand my Icom IC-736 (not Yaesu) demonstrates that Icom does know how to build an intuitive user interface. Maybe I'll trade my IC-820 when Icom builds one into the same chasis they use for the 736, 737, and 738.

Worst gripe about the IC-820? It didn't come with a microphone. Now Icom is running a promotional for Christmas where they ship an external vox. Wonder if you still have to provide your own mic?

73, David N4HHE
dkelly@nebula.tbe.com

2094. Re: WISP with SASI SatTracker

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 11:04:30 UTC
From: chris@zl2tpo.actrix.gen.nz
Message-ID: <464@zl2tpo.actrix.gen.nz>
Source record: 26251

In article <D0Lqou.Cxw@iglou.com>, Charles A. Rubenstein (rubenc@iglou.iglou.com) writes:
>
>Is anyone working on a driver for the SASI SatTracker & Frequency Manager
>to work with WISP? I have that setup because its the only one that supports
>the Icom 820H so far. I can use ORBITDRV to run it, but when I make a batch
>file that first goes to ITRACK to run the rotor and radio, then to WISP, WISP
>immediately EXITS back to windows. Any suggestions? Or maybe some one HAS
>written a driver?

WiSP requires a propper Windows driver. Using ITRACK etc, won't
really work. I know that a driver is being written for the
SatTracker, but I am not sure of the current status.

Chris ZL2TPO

2095. MIR voice pass / question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 13:20:35 UTC
From: arbee@teleport.com
Message-ID: <3ceub3$992@kelly.teleport.com>
Source record: 26248

Howdy all!

The 12/11/94 04:54:00 PST pass of the MIR over the Pacific Northwest was heard load and clear, towards the tail end of the pass the packet bursts stopped and were replaced by the voice of a cosmonaut! He was calling for "Dave" N6???, I have not heard a voice pass since this time last year..

Question: Who are the cosmonauts currently on the MIR, what are their call signs (and names?) Also, is it acceptable to attempt a QSO with a cosmonaut by calling R0MIR, if you don't know the calls of the individule comonauts?

Thanks for your input!

73

Johnnie Jordan KB7VZL (Salem, Oregon. USA)

--
arbee@teleport.COM

2096. KEP elements for odd sats.

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 13:28:48 UTC
From: arbee@teleport.com
Message-ID: <3ceuqg$99m@kelly.teleport.com>
Source record: 26249

I once ran across a text file on a packet BBS that had the KEP elements for about 150 sats, does anyone happen to have current (or even slightly old) elements for stas other than those normally found on here and on packet (OSCARs, NOAA, Television etc).. I don't need them for anything in particular, just interesting to check out now and again..

Thaks for posting what you have, if you have.. :)

73

Johnnie Jordan KB7VZL (Salem, Oregon. USA)

KB7VZL@N7IFJ.OR.USA.NA

--
arbee@teleport.COM

2097. Question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 18:49:00 UTC
From: don.horton@woodybbs.com
Message-ID: <93.2143.7587.0NFB7526@woodybbs.com>
Source record: 26259

On 12-06-94 CHRISTOPHER SUE-LING wrote to ALL...

CS> What radio frequency would you have used to listen to the
CS> Space Shuttle STS-64 mission?

Retransmissions from WA3NAN, Goddard Space Flight Center A.R.S.:

3.680 LSB, 7.185 LSB, 14.295 USB, 21.395 USB, 28.650 USB

Don N1ISB

---
* OFFLINE 1.58 * DARE to keep kids off drugs! Get them involved in Amateur Ra
io!

--- WILDMAIL!/WC v4.11b
* Origin: The Checkered Flag! Home of AUTORACE(413)499-1327 (1:321/210.0)

2098. Re: KEP elements for odd sats.

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 18:51:10 UTC
From: dshirah@spartan.com
Message-ID: <3cfat2$84a@data.interserv.net>
Source record: 26250

Try ftp to archive.afit.af.mil it has many..many..many keps.

good luck dshirah@spartan.com

2099. Pentium bug & satellite t

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 18:55:00 UTC
From: don.horton@woodybbs.com
Message-ID: <93.2144.7587.0NFB7527@woodybbs.com>
Source record: 26260

On 12-07-94 CAVER@ACCA.NMSU.EDU wrote to ALL...

C > My question to this group is, has anyone analyzed the impact of this
C > chip
C > problem on satellite tracking software? I'm particularly interested in

Haven't done an analysis because I track very well with 486/33.
My gut reaction though is that this hobbyist needs more accuracy
than Intel thinks. An accurate Epoch Date/Time requires a few
decimal places. Accurate to 10 minutes won't work... accurate
to 10 seconds is barely tolerable. I need to know where it IS,
not where it was!

Don N1ISB
---
* OFFLINE 1.58 * Real hams are just naturally salty

--- WILDMAIL!/WC v4.11b
* Origin: The Checkered Flag! Home of AUTORACE(413)499-1327 (1:321/210.0)

2100. Re: Satellite equipment

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 19:45:23 UTC
From: gras@alaska.net
Message-ID: <3cfksj$iaj@calvino.alaska.net>
Source record: 26252
Cross-posted to: rec.radio.amateur.space,rec.radio.amateur.equipment

In article <3c61ua$qqh@cello.gina.calstate.edu>, Robert D Houghton
<rhought@cello.gina.calstate.edu> says:
>

>I am tempted to buy the Icom beacuse of its advertised 9600 bps "plug and
>play" and its smaller size. I don't want to shell out my cash until iv'e
>heard from some users. I am primarily interested in working the
>microsats, both 9600 bps fm and 1200 PSK. Although the Yeasu will do
>9600 after mods, the thought of paying almost $2k for a radio and then
>wiggling capacitors until they break off and the like doesn't appeal to
>me.
>
>If anyone reading this is using any of the three radios mentioned above,
>I'd love to hear what you like / dislike about your radio as well as your
>other equipment and modes that you work.
>

James Miller G3RUH wrote a very extensive article regarding the ICOM-820H.
The plug and play 9600 baud is not setup for pacsat use and requires some
modifications to the radio.

I recommend anyone concidering purchasing a new satellite radio read his
article. It can be downloaded from ftp.qualcomm.com amsat/articles/g3ruh
the file is a103.zip

73
KL7GR

2101. Need dsp chip set for satellite modem

Newsgroup: rec.radio.amateur.space
Date: 1994-12-11 20:25:20 UTC
From: Dmitry Simanenkov <dima@pcom.spb.su>
Message-ID: <AGwBrwkew4@pcom.spb.su>
Source record: 26253

Need DSP chip set for satellite modem

2102. Re: MIR voice pass / question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-12 00:05:42 UTC
From: n7ryw@teleport.com
Message-ID: <n7ryw.73.00001860@teleport.com>
Source record: 26254

In article <3ceub3$992@kelly.teleport.com> arbee@teleport.com (John Jordan KB7VZL) writes:
>From: arbee@teleport.com (John Jordan KB7VZL)
>Subject: MIR voice pass / question
>Date: 11 Dec 1994 05:20:35 -0800

>Howdy all!

>The 12/11/94 04:54:00 PST pass of the MIR over the Pacific Northwest was
>heard load and clear, towards the tail end of the pass the packet bursts
>stopped and were replaced by the voice of a cosmonaut! He was calling
>for "Dave" N6???, I have not heard a voice pass since this time last
>year..

If I remember right, that's Dave Medley.

>Question: Who are the cosmonauts currently on the MIR, what are their
>call signs (and names?) Also, is it acceptable to attempt a QSO with a
>cosmonaut by calling R0MIR, if you don't know the calls of the individule
>comonauts?

I've long ago lost track of who is on board. When in doubt, use the same call as what you see on packet. Due to power problems, the use of the amateur equipment has been drastically curtailed. As they rectify the problems, it should be getting used more and more.

Bill, n7ryw@teleport.com

2103. Re: Has anyone heard Mir lately?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-12 08:18:26 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3ch10i$re8@news.doit.wisc.edu>
Source record: 26255

In article <3cas3n$ljn@news.doit.wisc.edu>, djmullen@facstaff.wisc.edu (Dave Mullenix) says:
>
>The Subject pretty well tells the story. Has anybody hear anything
>from Mir lately? I had a chance to listen a few nights ago and
>never heard a peep on five passes. Anybody have better luck?
>
>Dave, N9LTD

I've had email from five people who have heard packet, heard voice or even WORKED MIR VIA VOICE in the last week. The latter exploit is also featured in the current AMSAT Bulletin.

Thanks to all who replied,
Dave, N9LTD

2104. Re: 95 STS Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-12-12 13:03:05 UTC
From: tcmayo@eng103.PSF.GE.COM
Message-ID: <3chhm9$ksq@eng103.PSF.GE.COM>
Source record: 26256

In article <hcxUWsW.perriello@delphi.com>,
Dean Perriello <perriello@delphi.com> wrote:
>I am looking for a 1995 space shuttle schedule. Anyone know where I
>could find it?
>
>Dean Perriello N4TYS

Me too! Me too!

-Tom N1RMU tcmayo@mntr02.psf.ge.com

2105. Re: 95 STS Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-12-12 17:23:33 UTC
From: rickvg@usa.net
Message-ID: <R08xkSEHG-iE075yn@usa.net>
Source record: 26257

tcmayo@eng103.PSF.GE.COM (Tom Mayo) wrote:
>Dean Perriello <perriello@delphi.com> wrote:
>>I am looking for a 1995 space shuttle schedule. Anyone know where I
>>could find it?
>>
>>Dean Perriello N4TYS
>
>Me too! Me too!
>
>-Tom N1RMU tcmayo@mntr02.psf.ge.com

-- Extracted from --

Steven S. Pietrobon, Australian Space Centre for Signal Processing
Signal Processing Research Institute, University of South Australia
The Levels, SA 5095, Australia. steven@spri.levels.unisa.edu.au

Current versions of the Unofficial Space Shuttle Manifest (this file) and
Unofficial Space Shuttle Launch Guide (for detailed information on how to see
a shuttle launch) can be found by anonymous ftp to audrey.levels.unisa.edu.au
in directory space in files shuttle.man and shuttle.txt, respectively.

Current and previous versions of these files can also be obtained by anonynmous
ftp to explorer.arc.nasa.gov (128.102.32.18) in directory /pub/SPACE/MANIFEST
in files manifest and launchpass. The shuttle press kit is also available in
directory /pub/SPACE/PRESS.KIT and is usually available about a week before
launch.

For the latest and greatest information call the following:

1 800 572 4636 - Visitor Information Center information and next launch.
1 800 KSC INFO Florida 1 800 number. Florida only information thanks to
Richard F. Jones (rfj@alpha.sunquest.com)
(407) 867 4636 - Space shuttle mission information.
(407) 867 2525 - Space shuttle launch preparations.
(407) 867 3900 - Space shuttle status line. Technical, lots of TLA's. Just
remember, we warned you.

You can also:

finger @calvin.ksc.nasa.gov or finger @128.159.104.72
finger nasanews@space.mit.edu

73 -- Rick

****
* Rick von Glahn Edge of Space Sciences, Inc. *

```
* rickvg@usa.net - Internet (preferred) Promoting Science and Education *
* N0KKZ@W0GVT.#NECO.CO.USA - packet radio through Amateur Radio and *
* finger rickvg@usa.net for EOSS info High Altitude Balloons *
************************************************************************
```

2106. multi mode dual band for satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-12 21:40:47 UTC
From: Wayne_Estes@csg.mot.com
Message-ID: <9412121540.ZM20615@SALCIUS2>
Source record: 26258

Save $1000 or so, and look for a used Yaesu FT-726R It must have the satellite option board, otherwise you can't operate full duplex. I got mine for $800 with the satellite board and HF module. The HF module is hard to find, though. It puts out 10W (all modes) on 10, 12, and 15 meters.

It only has 10 simplex memories, no duplex memories. And you have to tune the transmit and receive frequencies separately, but that is not really a problem when operating AO-13 or AO-10. For the PacSats you can use a Kansas City Tracker or Trakbox to auto tune using the up-down lines on the microphone connector.

The FT-726R only puts out 10 watts, but 25 watts from the FT-736R is still not enough for reliable operation on AO-13 or AO-10. Most people run 50-100 watts.

One disadvantage of the FT-726R is that there is no 1270 MHz module available. If you want 1270 MHz (for Phase 3D) you need the FT-736R and the $600 module. I plan to get a transmit converter for 1270 MHz operation on Phase 3D, since this is an "uplink only" band.

73 de Wayne Estes WD5FFH wayne@csg.mot.com

2107. Re: Amateur Static Satellite Tracking

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 01:50:24 UTC
From: dgrybos@aol.com
Message-ID: <3ciul0$hc5@newsbf01.news.aol.com>
Source record: 26061

In article <37jppcINNco6@diable.upc.es>, caralt@gaig.upc.es (Jordi Caralt Barba) writes:

The phased array project for an amateur satellite ground station.

I was also interested in your project. It is related to my professional interests. I will ask around and see if there are any suggestions to your questions on phase shifters etc.

I agree that the biggest chalenges will be wide scan angle performance. Axial ratio will be difficult as you inddicated. Also element mutual coupling will come into play.

73's David, KK6US

2108. Re: Pentium bug & satellite t

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 04:02:02 UTC
From: n7ryw@teleport.com
Message-ID: <3cj6ab$lrm@desiree.teleport.com>
Source record: 26062

In article <93.2144.7587.0NFB7527@woodybbs.com>, don.horton@woodybbs.com said...

> Haven't done an analysis because I track very well with 486/33.
> My gut reaction though is that this hobbyist needs more accuracy
> than Intel thinks. An accurate Epoch Date/Time requires a few
> decimal places. Accurate to 10 minutes won't work... accurate
> to 10 seconds is barely tolerable. I need to know where it IS,
> not where it was!

I took a disk with InstantTrack to my local dealer friend, and used a 90 mHz Pentium next to a 486-66 to see the difference. The older the elements, the greater the error, which is to be expected. The more the calculations, the more the errors. It looked like if the Keps were more than a day or two old, you are out of luck with the Bugium. One way or another, if you have one of these, get the replacement. Bugs should NEVER be tolerated!

If it were a car, it would have been recalled immediately.

--
From Bill, n7ryw@teleport.com

2109. Re: Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 11:00:18 UTC
From: moritz@ipers1.e-technik.uni-stuttgart.de
Message-ID: <3cjus2$h1l@info4.rus.uni-stuttgart.de>
Source record: 26063

In article <3c2fp7$798@therag.zso.dec.com>,
Eric Rehm <rehm@slugbt.zso.dec.com> wrote:
>
>I'd like to build a simple solar receiver that would demonstrate
>that the sun emits radio waves in addition to light and heat.
>

Eric,

There is not really a simple solution. May be the smallest system is
to use an 8meter long yagi on 2m or 70cm, fix its direction, have a
low noise preamp and record the output as the sun wanders through the
main antenna lobe.
An alternative might be a TVRO dish and a low noise amp in the microwave range.

Both solutions may be put up for little money, but these are not *small*
antennas.

Good Luck, Moritz DL5UH

2110. Meteor Skeds ???

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 14:09:29 UTC
From: nu-way@ic.net
Message-ID: <3ck9uq$fgs@condor.ic.net>
Source record: 26064

Anyone want to try a meteor SKED tonite? The peak of the Geminids shower is predicted to be around 0500Z 12/14. I'm looking SSE to SSW from EN82gt (NW of Detroit, MI).

I have a SKED on 144.143 at 0300Z - 0320Z. Available anytime after that.

CALL: WD8BKM
GRID: EN82gt
NAME: Tom

Please reply via e-mail to nu-way@ic.net. Reply with call, grid, time, procedure (1st & 3rd, 2nd & 4th).

73, Tom.

2111. PSK and 9600 Baud Modem Wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 20:36:48 UTC
From: Gerald Schmitt <ggs@aerie.lanl.gov>
Message-ID: <3cl12k$8qc@newshost.lanl.gov>
Source record: 26065
Cross-posted to: rec.radio.swap,rec.radio.amateur.space,rec.radio.amateur.equipment,rec.radio.amateur.digital.misc

Someone posted to one of these groups looking for a PSK modem
and possibly a 9600 baud modem. I seem to have lost the post but
I have a PacComm PSK-1 and NB-9600 along with the associated cables
power supplies etc. I am strongly leaning to the TAPR DSP kit as a
project making these modems surplus. If you are the person looking for
these modems drop me an e-mail and we can discuss a deal.
Gerald Schmitt
KC5EGG@WB2ARS.NM.USA.NOAM
ggs@aerie.lanl.gov

2112. Re: 95 STS Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 22:14:29 UTC
From: aranders@kosepc01.delcoelect.com
Message-ID: <3cl6c5$p94@kocrsv08.delcoelect.com>
Source record: 26067

In article <hcxUWsW.perriello@delphi.com>,
Dean Perriello <perriello@delphi.com> wrote:
>I am looking for a 1995 space shuttle schedule. Anyone know where I
>could find it?

In <3chhm9$ksq@eng103.PSF.GE.COM>,
tcmayo@eng103.PSF.GE.COM (Tom Mayo) writes:
>Me too! Me too!

Try the sci.space.shuttle newsgroup -- you should find answers there.
The space calendar is also posted monthly to sci.space.policy at least,
and I think to sci.space.news.

==
Alan Anderson .-- -... ----. .-. ..- ..-. | Ignorance can be fixed,
(I speak AT, not FOR, Delco Electronics) | but stupidity is permanent.

2113. GEtting started: need lists of sats and xponders

Newsgroup: rec.radio.amateur.space
Date: 1994-12-13 22:31:11 UTC
From: cap2624@ultb.isc.rit.edu
Message-ID: <1994Dec13.223111.8338@ultb.isc.rit.edu>
Source record: 26066

I am just getting started with packet, and satelite tracking. I would
like to know where I can find a list of sats I can listen to (i.e. not
necessarily for HAM) and all the amature satelites. I have the Keps for
the amature and weather sats from ftp.amsat.org, but I want descriptions
of each satelite and the TRANSPONDER frequencies of EACH. Thanks!
--
+---+
| Rochester Institute of Technology Christopher A. Peskin |
| Electrical Engineering |
+---+

2114. Pentium

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 02:33:22 UTC
From: roffer@rcf.rsmas.miami.edu
Message-ID: <3cllhi$ome@umigw.miami.edu>
Source record: 26068

We have experienced problems with navigation based on TBUS
elements using a Pentium based system. We have ordered a
new, corrected chip, from Intel and will have to wait
a month for it. While I do not know for sure that our
odd behavior is due to this, but I suspect it is.

Regards
Mitch Roffer
Roffer@rcf.rsmas.miami.edu

2115. Re: IC820H

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 03:50:06 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <rlong-131294224708@slip3-37.acs.ohio-state.edu>
Source record: 26069

In article <3c75fh$1du@netnet2.netnet.net>, dec@netnet.net (Dan E Carlisle)
wrote:

> Before you go buying this radio thinking that it is 9600 ready, please download
>
> the review by James Miller, G3RUH, that was recently published in the amsat
> journal entitled: "Review of a 9600 Baud ready radio -that isn't"
> from
> ftp.amsat.org (192.35.156.5)
> /amsat/articles/g3ruh/a103.zip
>
> 73
> dec@netnet.net

The Amsat Journal has not published this article.
There was an article entitled, "Icom's IC-820H A
Satellite user's perspective" in the Oscar News
from Amsat-UK, August 1994, page 3.

The ftp part may be accurate.

Ron w8gus.

2116. Re: 95 STS Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 06:12:00 UTC
From: ernie.koch@freddy.supernet.ab.ca
Message-ID: <89F9570.14E6000042.uuout@freddy.supernet.ab.ca>
Source record: 26070

-> >I am looking for a 1995 space shuttle schedule. Anyone know where I
-> >could find it?
-> >
-> >Dean Perriello N4TYS
->
-> Me too! Me too!
->
-> -Tom N1RMU tcmayo@mntr02.psf.ge.com

Hi Guys,

Posible info can be had from "Marshall Space Flight Centre"
The BBS number (205) 895-0028. Up to 9600baud only.

Good Luck
73 de Ernie VE6LU

2117. CELESTIAL BBS NUM.

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 06:36:02 UTC
From: dave2@net-works.com
Message-ID: <12131994.223602@net-works.com>
Source record: 26075

Re: Can't get in Nasa Spacelink anymore! Plus.....

205-409-9280 IN HUNTSVILLE/ MONTGOMERY AL. AREA.

2118. NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 12:25:25 UTC
From: jcarter@orl.mmc.com
Message-ID: <3cmo7l$kle@theopolis.orl.mmc.com>
Source record: 26071

I was watching NASA-SELECT TV this morning at 4am eastern.
They had live coverage oc the NOAA-J launch. There was a hold
at about 4:04 am and I had to leave so I missed the rest. There
was a problem with something related to a gyro. Launch time was
set at 4:02 am eastern with a 10 min window. Did they get it off
in the window?

Jim

\/\/ * \/ _._. __._ /\/\/ | James A. Carter (Jim) | jcarter@orl.mmc.com |
/|\ | Senior Software Engineer |_____|
/\|/\ K D 4 P O N | Martin Marietta | These views are my own |
/\/|\/\ ORLANDO | Mail Point 138 | and not that of my |
/\/\|/\/\ FLORIDA USA | 5600 Sand Lake Road | employer. |
/\/\/|\/\/_____| Orlando, FL 32819-8907 |_____73's_Jim ____|

2119. Re: Solar Radio Astronomy Help?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 12:41:44 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3cmp68$38k@news.doit.wisc.edu>
Source record: 26072

In article <3cjus2$h1l@info4.rus.uni-stuttgart.de>,
moritz@ipers1.e-technik.uni-stuttgart.de () says:

Eric Rehm <rehm@slugbt.zso.dec.com> wrote:

>>I'd like to build a simple solar receiver that would demonstrate
>>that the sun emits radio waves in addition to light and heat.
>
>There is not really a simple solution. May be the smallest system is
>to use an 8meter long yagi on 2m or 70cm, fix its direction, have a
>low noise preamp and record the output as the sun wanders through the
>main antenna lobe.
>An alternative might be a TVRO dish and a low noise amp in the microwave range.
>
>Both solutions may be put up for little money, but these are not *small*
>antennas.

I've seen letting the sun drift past a fixed yagi given as a good test
of a low noise pre-amp. If it's working right, you should see a definite
increase in noise as the sun drifts through the antenna's beam pattern.

Everybody with a TVRO dish gets a demo of the sun's microwave RF energy
twice a year when the Clark belt gets between the earth and the sun and
the sun's microwve energy drowns out the much weaker signals coming
from the satellites. These events are called sun outages and they're
regularly announced.by the various satellite and cable companies.

2120. Shuttle Launch Schedule - 95 - shutmanf.msg [1/1]

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 13:24:56 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3cmrn8$38k@news.doit.wisc.edu>
Source record: 26073

In answer to a request for a schedule of shuttle launches in 95 - I found
this on sci.space.shuttle.

From: steven@igor.Levels.UniSA.Edu.Au (Steven Pietrobon)
Newsgroups: sci.space.shuttle
Subject: Unofficial Space Shuttle Manifest (Dec 1994)
Date: 1 Dec 1994 04:30:33 GMT
Organization: University of South Australia
Lines: 250
Sender: steven@igor (Steven Pietrobon)
Distribution: world
Expires: 31 Dec 1994 23:59:59 GMT
Message-ID: <3bjjh9$l5q@vail.levels.unisa.edu.au>
Reply-To: steven@spri.levels.unisa.edu.au
NNTP-Posting-Host: igor.levels.unisa.edu.au

Rev 25 Nov 1994

The following is the Unofficial Space Shuttle Manifest. This file gives the
launch dates, orbiter, and payloads for upcoming shuttle launches. The launch
time and orbit parameters are also given where available. Note that the launch
date and time are officially set about two weeks before launch at the Flight
Readiness Review (which usually selects the date and time in the manifest).
The manifest is also subject to a lot of shuffling and date changing (which
leads to the STS numbers not being in order) so beware when planning to see a
shuttle launch.

Please send changes and updates to:

Steven S. Pietrobon, Australian Space Centre for Signal Processing
Signal Processing Research Institute, University of South Australia
The Levels, SA 5095, Australia. steven@spri.levels.unisa.edu.au

Current versions of the Unofficial Space Shuttle Manifest (this file) and
Unofficial Space Shuttle Launch Guide (for detailed information on how to see
a shuttle launch) can be found by anonymous ftp to audrey.levels.unisa.edu.au
in directory space in files shuttle.man and shuttle.txt, respectively.

Current and previous versions of these files can also be obtained by anonynmous
ftp to explorer.arc.nasa.gov (128.102.32.18) in directory /pub/SPACE/MANIFEST
in files manifest and launchpass. The shuttle press kit is also available in
directory /pub/SPACE/PRESS.KIT and is usually available about a week before
launch.

For the latest and greatest information call the following:

1 800 572 4636 - Visitor Information Center information and next launch.
1 800 KSC INFO Florida 1 800 number. Florida only information thanks to
Richard F. Jones (rfj@alpha.sunquest.com)
(407) 867 4636 - Space shuttle mission information.
(407) 867 2525 - Space shuttle launch preparations.
(407) 867 3900 - Space shuttle status line. Technical, lots of TLA's. Just
remember, we warned you.

You can also:

finger @calvin.ksc.nasa.gov or finger @128.159.104.72
finger nasanews@space.mit.edu

Abbreviations used in manifest:

STS - (Space Transportation System) number of the flight. The STS numbers are
not in order due to delays in some missions and changes in schedule once an
STS number has been assigned.

Date - Day Month Year - dd mm yy (Note that most launches are on Thursday.)

Time - Earliest launch time. The "S" means "U.S. Eastern Standard Time" and "D"
means "U.S. Eastern Daylight Time".

Window h:mm - The time frame, in hours:minutes, available for launch that day.
Some windows have "COLAs" (Collision Avoidance) during the window when the
shuttle cannot launch.

Inc. deg. - Inclination of the orbit in degrees when the shuttle is launched.

Alt. km - Altitude in kilometres.
1 nautical mile = 1.852 km (exactly), 1 statute mile = 1.609344 km (exactly),
1000 feet = 304.8 m (exactly). (I wish NASA would use ONE unit for distance :-)

The abbreviations for the Orbiter names are
Col Columbia (OV-102)
Dis Discovery (OV-103)
Atl Atlantis (OV-104)
End Endeavour (OV-105)

Payload - Payloads in the cargo bay that are being launched.

SPACE SHUTTLE MANIFEST (25 Nov 1994)

Window Inc. Alt.
STS Date Time h:mm deg. km Orbiter Payload
---
63 2 Feb 95 0051S 0:05 51.60 315 Dis-20 SPACEHAB-03, SPTN 204, CGP,
ODERACS-02, CONCAP II, EDFT-01
67 23 Feb 95 0137S 2:03 28.45 352 End-08 ASTRO-02, GAS(2), EDO, SAREX II
71 24 May 95 0800D 0:05 51.60 315 Atl-14 S/MM-01, SL-M (Spacelab MIR)
70 22 Jun 95 1113D 4:00 28.45 296 Dis-21 TDRS-G, ITEPC
69 20 Jul 95 0800D 4:00 28.45 370 End-09 WSF-02, SPTN 201-03, OAST-03,
IEH-01, EDFT-02, ITEPC
73 25 Sep 95 1042D 4:00 39.00 278 Col-18 USML-02, OARE-02, EDO

74 26 Oct 95 0800D 4:00 51.60 315 Atl-15 S/MM-02, Docking Module
72 30 Nov 95 0800S 4:00 28.45 463 End-10 SFU-RETR, OAST-FLYER, GAS(4),
SSBUV/A-05, SLA-01, EDFT-03
---
75 15 Feb 96 - - 28.45 296 Col-19 TSS-1R, USMP-03, EDO
76 21 Mar 96 - - 51.60 315 Atl-16 S/MM-03, Long Module
77 25 Apr 96 - - 28.45 296 End-11 SPACEHAB-04, ORFEUS-SPAS-02,
GBA(12)
78 27 Jun 96 - - 28.45 296 Col-20 LMS-1, SSBUV/A-06, IEH-02, EDO
79 1 Aug 96 - - 51.60 315 Atl-17 S/MM-04, SPACEHAB-05, EDFT-04
80 7 Nov 96 - - 28.45 352 Col-21 WSF-03, IAE, SPAS-III, EDFT-05
81 5 Dec 96 - - 51.60 315 Atl-18 S/MM-05, Long Module

S = Eastern Standard Time (-5:00 GMT), D = Eastern Daylight Time (-4:00 GMT)
ASTRO Ultraviolet Astronomy
CGP Cryo Systems Experiment GLO-II Payload
CONCAP Consortium for Materials Development in Space Complex Autonomous Payload
EDO Extended Duration Orbiter
EDFT ?
GAS Get Away Special
GBA GAS Bridge Assembly
IAE Inflatable Antenna Experiment
IEH International Extreme-UV Far-UV Hitchhiker
ITEPC Inter Mars Tissue Equivalent Proportional Counter
LMS ?
OARE Orbital Acceleration Research Experiment
OAST NASA Office of Aeronautics and Space Technology
ODERACS Orbital Debris Radar Calibration Spheres
ORFEUS Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer
SAREX Shuttle Amateur Radio Experiment
SFU-RETR Space Flyer Unit Retrieval
SLA Shuttle Laser Altimeter
SL-M Joint USA/Russian MIR Docking/Spacelab Life Sciences
S/MM Shuttle Mir Mission
SPAS Shuttle Pallet Satellite
SPTN Shuttle Pointed Autonomous Research Tool for Astronomy (aka SPARTAN)
SSBUV Shuttle Solar Backscatter Ultra-Violet Instrument
TDRS Tracking and Data Relay Satellite
TSS Tethered Satellite System
USML United States Microgravity Laboratory
USMP United States Microgravity Payload
WSF Wake Shield Facility

SPACE SHUTTLE MANIFEST (15 Nov 1994)

STS Date Orbiter Payload (continued)
---
82 13 Feb 97 Dis-22 HST SM-02
83 3 Apr 97 Col-22 MSL-01 (Materials Science Laboratory), EDO
84 1 May 97 Atl-19 S/MM-06, Solar Dynamic
85 26 Jun 97 Dis-23 SPACEHAB-06, CRISTA-SPAS-02, JFD, SEDSAT

86 11 Sep 97 Atl-20 S/MM-07, Long Module
87 9 Oct 97 Col-23 SPACEHAB-07, USMP-04, EURECA-2L, SSBUV/A-07
88 4 Dec 97 End-12 SSAF-02A, Node 1 (2 Storage Racks), PMA1, PMA2
---
89 26 Feb 98 Col-24 NEUROLAB (Space Life Sciences Laboratory), EDO
90 16 Apr 98 Dis-24 SPACEHAB-08, WSF-04
91 7 May 98 End-13 SSAF-03A, Z1 Truss, PMA3, Ku-Band, EVAS, CMGs, SPL
92 23 Jul 98 Col-25 AXAF-I, EURECA-2R
93 6 Aug 98 Dis-25 SSAF-04A, P6, PV Array (4 Battery Sets)-TCS Radiators,
S-Band
94 1 Oct 98 End-14 SSAF-05A, Lab (4 Lab Sys Racks)
95 Dec 98 Atl-21 SSAF-06A, MPLM (1 Storage, 7 Lab Sys Racks), UHF, SSRMS
---
96 11 Feb 99 Dis-26 SSUF-01, MPLM (ISPRs)
97 18 Mar 99 End-15 SSAF-07A, Airlock, HP Gas
98 May 99 Atl-22 SSAF-08A, S0, MT, GPS, Umbilicals, A-L Spur
99 22 Jul 99 End-16 SSUF-02, MPLM (ISPRs, 2 Storage Racks), MBS
100 Aug 99 Dis-27 SSAF-09A, S1 (3 Rads), TCS, CETA, S-Band, Ext Cameras
101 28 Oct 99 Atl-23 SSAF-10A, Node 2 (4 DDCU Racks), Cupola, 1 O2 Tank
102 24 Nov 99 End-17 SSAF-11A, P1 (3 Rads), TCS, CETA, UHF, Ext Cameras
---
AXAF-I Advanced X-Ray Astrophysics Facility-Imager
CETA Crew and Equipment Translation Aid
CMG Control Moment Gyro
CRISTA Cryogenic Infrared Spectrometer Telescope for Atmosphere
DDCU DC-to-DC Converter Unit
EDO Extended Duration Orbiter
EURECA European Retrievable Carrier
EVAS Extravehicular Activity System
FLT OPPTY Flight Opportunity
GPS Global Positioning System
HST SM Hubble Space Telescope Servicing Mission
ISPR International Standard Payload Rack
JFD JEM (Japanese Experiment Module) Flight Demonstration
MBS Mobile Base Support
MPLM Mini Pressurised Logistics Module
MT Mobile Transporter
OAST NASA Office of Aeronautics and Space Technology
PMA Pressurized Mating Adapter
PV Photovoltaic
Px Port Truss Element
Sx Starboard Truss Element
S/MM Shuttle Mir Mission
SEDSAT ?
SPAS Shuttle Pallet Satellite
SPL Solar Pumped Laser
SSAF-xxA Space Station Assembly Flight - American Element
SSBUV Shuttle Solar Backscatter Ultra-Violet Instrument
SSRMS Space Station Remote Manipulator System
SSUF Space Station Utilisation Flight

TCS Thermal Control System
UHF Ultra High Frequency
USMP United States Microgravity Payload
WSF Wake Shield Facility

SPACE SHUTTLE MANIFEST (9 Nov 1994)

STS Date Orbiter Payload (continued)
---
103 13 Jan 00 Dis-28 SSAF-12A, P3-4, PV Array (4 Battery Sets), 2 ULCAS
104 10 Feb 00 Atl-24 SSAF-01J/A, JEM ELM PS (5 JEM Sys, 2 ISPR, 1 Storage Racks), SPDM, ULC (2 O2 Tanks)
105 30 Mar 00 End-18 SSAF-01J, JEM PM (3 JEM Sys Racks), JEM RMS
106 25 May 00 Col-26 HST SM-03
107 Jul 00 Atl-25 SSUF-03, MPLM (ISPRs, 1 Storage Rack), P5
108 5 Oct 00 End-19 SSAF-13A, S3-4, PV Array (4 Battery Sets), 4 PAS
109 2 Nov 00 Col-27 EURECA-3L
---
110 Feb 01 Atl-26 SSAF-02J/A, JEM EF, JEM ELM ES, ULC (4 PV Battery Sets)
111 29 Mar 01 Dis-29 SSUF-04, MPLM (ISPRs), ULC (1 O2 Tank, Attached Payload)
112 31 May 01 Col-28 FLT OPPTY
113 Jun 01 Atl-27 SSAF-02E, MPLM (1 APM Storage, 3 US Storage, 7 JEM Racks), ULC (2 PV Battery Sets)
114 9 Aug 01 Dis-30 SSUF-05, MPLM (ISPRs, 1 Storage Rack)
115 4 Oct 01 Col-29 EURECA-3R
116 15 Nov 01 Atl-28 SSAF-14A, Centrifuge (10,900 kg), S5
---
117 24 Jan 02 Dis-31 SSAF-15A, PV Array (4 Battery Sets), Port MT-CETA Rails
118 21 Feb 02 End-20 SSUF-06, MPLM (ISPRs), ULC (1 O2 Tank, Attached Payload)
119 4 Apr 02 Atl-29 SSAF-16A, Hab (6 Hab Racks)
120 2 May 02 Dis-32 SSAF-17A, MPLM (1 Lab Sys, 8 Hab Sys Racks), ULC (2 PV Battery Sets)
121 27 Jun 02 End-21 SSAF-19A, MPLM (3 Hab Sys, 11 US Storage Racks)

APM Attached Pressurised Module
CETA Crew and Equipment Translation Aid
EURECA European Retrievable Carrier
FLT OPPTY Flight Opportunity
HST SM Hubble Space Telescope Servicing Mission
ISPR International Standard Payload Rack
JEM Japanese Experiment Module
JEM EF JEM Exposed Facility
JEM ELM ES JEM Experimental Logistics Module Exposed Section
JEM ELM PS JEM Experimental Logistics Module Pressurised Section
JEM PM JEM Payload Module
JEM RMS JEM Remote Manipulator System
MPLM Mini Pressurised Logistics Module
MT Mobile Transporter
PV Photovoltaic
Px Port Truss Element
Sx Starboard Truss Element

SPDM Special Purpose Dexterous Manipulator
SSAF-xxA Space Station Assembly Flight - American Element
SSAF-xxE Space Station Assembly Flight - European Element
SSAF-xxJ Space Station Assembly Flight - Japanese Element
SSAF-xxJ/A Space Station Assembly Flight - Japanese and American Element
SSUF Space Station Utilisation Flight
ULC Unpressurized Logistics Carrier
ULCAS Unpressurized Logistics Carrier Attach System

Keepers of the manifest, in remembrance:
Ken Hollis - hollis@titan.ksc.nasa.gov - 1990 Thru 03/09/1994
- Banned from posting to sci.space.shuttle by NASA and Lockheed

2121. Pentiums and IT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-14 14:10:35 UTC
From: carrl@gordon-tsd1.ARmy.MIL
Message-ID: <9412141410.AA07489@gordon-tsd1.army.mil>
Source record: 26074

A friend of mine has an HP Pentium 60Mhz machine that has problem running Instant Track... it will run the software but numbers and video are distorted.... anyone have a similar problem?
carrl@gordon-tsd1.army.mil

2122. HTTP Satellite Info?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 01:20:10 UTC
From: arthurc@crl.com
Message-ID: <3co5ka$p29@crl9.crl.com>
Source record: 26076

Could someone post or email me any helpful and/or spiffy http pages
with Ham/satellite info? I'm brand new to the satellite world, so
anything and everything = appreciated.
Thanks!

2123. Re: NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 02:03:11 UTC
From: Paul Ruscher <ruscher@met.fsu.edu>
Message-ID: <3co84v$2cf@mailer.fsu.edu>
Source record: 26077

jcarter@orl.mmc.com (James Carter) wrote:
>
> I was watching NASA-SELECT TV this morning at 4am eastern.
> They had live coverage oc the NOAA-J launch. There was a hold
> at about 4:04 am and I had to leave so I missed the rest. There
> was a problem with something related to a gyro. Launch time was
> set at 4:02 am eastern with a 10 min window. Did they get it off
> in the window?
Launch was scrubbed apparently due to problems with the booster.
Rescheduled now for Dec 20 at 5:05 PST I believe. At least the
winds cooperated today!
Paul Ruscher/FSU Meteorology & Florida EXPLORES!/Tallahassee
ruscher@met.fsu.edu
http://thunder.met.fsu.edu/explores/explores.html

2124. Re: NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 02:12:21 UTC
From: Paul Ruscher <ruscher@met.fsu.edu>
Message-ID: <3co8m5$2cf@mailer.fsu.edu>
Source record: 26078

Paul Ruscher <ruscher@met.fsu.edu> wrote:
>
> Rescheduled now for Dec 20 at 5:05 PST I believe. At least the
correction: 2:02 PST; 5:02 EST.

2125. Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 04:27:51 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3cogk7$see@cello.gina.calstate.edu>
Source record: 26079

I am wondering if anyone in this newsgroup has operated the microsats using a Macintosh computer, either by using PB/PG or WISP through an emulator such as SoftWindows or SoftPC or by using software specifically written for the Mac. I am currently working Pacsat and Lusat at my school using WISP running on a 486DX/33. I want to set up a ground station at home but don't want to buy an additional computer just so that I can play satellite.

If you can't answer my first question, I'd like to hear of *any* experiences, good or bad, running DOS or Windows programs on a Mac or PowerPC.

Thanks and 73,

Bob Houghton KC6LVG
Robert D. Houghton
Science Department Chairman
John A. Rowland High School
Rowland Heights, CA 91748
Also: rdhoughton@vms4.sci.csupomona.edu

2126. Re: HTTP Satellite Info?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 08:46:48 UTC
From: n7ryw@teleport.com
Message-ID: <3covo7$bf@desiree.teleport.com>
Source record: 26080

In article <3co5ka$p29@crl9.crl.com>, arthurc@crl.com said...
>
> Could someone post or email me any helpful and/or spiffy http pages
>with Ham/satellite info? I'm brand new to the satellite world, so
>anything and everything = appreciated.

http://www.teleport.com/~n7ryw/asatpage.html

Amsat also has a page, but I forget the URL. There is a link to it in
mine, though.

Have fun!

From Bill, n7ryw@teleport.com

2127. Re: Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 08:50:25 UTC
From: n7ryw@teleport.com
Message-ID: <3covv1$bf@desiree.teleport.com>
Source record: 26081

In article <3cogk7$see@cello.gina.calstate.edu>,
rhought@cello.gina.calstate.edu said...
>
>I am wondering if anyone in this newsgroup has operated the microsats
>using a Macintosh computer, either by using PB/PG or WISP through an
>emulator such as SoftWindows or SoftPC or by using software specifically
>written for the Mac.

I have seen it, and it isn't pretty. Wisp, especially, is very demanding
on a system, and these emulators are slow. If you do this, use a Track
Box for the tracking. It is essentially standalone, and makes no real
demands of the host computer. It does require its own serial port.

>If you can't answer my first question, I'd like to hear of *any*
>experiences, good or bad, running DOS or Windows programs on a Mac or
>PowerPC.

SLOW!!!!
--
From Bill, n7ryw@teleport.com

2128. MIR voice cntct foiled by jerk!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 13:16:33 UTC
From: arbee@teleport.com
Message-ID: <3cpfji$qp2@elaine.teleport.com>
Source record: 26082

For nearly two years I have been trying to work the MIR on a voice pass, I have worked it on packet about a zillion times, but really really wanted a confirmed voice contact. Well, this morning at about 4:30am I was writing a letter in another newsgroup when I heard the familiar sound of packet bursts on 145.550, I reached over to my other computer and booted up Instatrack, sure enough, there was the MIR.. A moment later came the sound I had been waiting for, CQ CQ in a decidely Russian accent! I scooted over to the mic and reponded with R0MIR this is KB7VZL, how do you copy? KB7VZL I copy you very clear, what is your name? My name is John, I'm located on the west coast of the United States in Salem, Oregon. How are you this morning? I asked.. Hello John I am BLEEEEEEEEP BLEEEEEEEEEEEP BLEEEEEEEEEP!

ACK!!! Packet tones!! Local packet tones!! Some jerk was trying to connect to the MIR packet station while I was talking to the Cosmonaut!! The packet continued for the entire pass and about 10 minutes after.. Several attempts to get the person on packet to go voice failed.. I believe this was an un-attended packet station which was acting on a script file, a very simple thing to do and a very very RUDE thing to do!

If you are new to packet, resist all temptation to write a script file to connect your terminal to the MIR pbbs, at the VERY LEAST be present and monitoring the MIR freq in case someone else is on the pbbs or VOICE with the cosmonaut!!!

If you operate an unattended packet station on 145.550, I hope lightning strikes your antenna! Gawd I'm mad.

John KB7VZL

--
arbee@teleport.COM

2129. Re: Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 15:12:33 UTC
From: rparsons@bga.com
Message-ID: <rparsons-1512940912330001@slip203.bga.com>
Source record: 26083

In article <3cogk7$see@cello.gina.calstate.edu>, Robert D Houghton
<rhought@cello.gina.calstate.edu> wrote:

> I am wondering if anyone in this newsgroup has operated the microsats
> using a Macintosh computer, either by using PB/PG or WISP through an
> emulator such as SoftWindows or SoftPC or by using software specifically
> written for the Mac. I am currently working Pacsat and Lusat at my
> school using WISP running on a 486DX/33. I want to set up a ground
> station at home but don't want to buy an additional computer just so that
> I can play satellite.
>
> If you can't answer my first question, I'd like to hear of *any*
> experiences, good or bad, running DOS or Windows programs on a Mac or
> PowerPC.
>

I have run (on a Quadra 700) with SoftPC with Windows, both PB/PG and Wisp.
There are problems with PG (it needs an active DCD line). I used PG_AEA
with my AEA DSP-2232 with no problems. Windows is such a dog that Wisp use
was not successful. I added the DOS Compatibility Card (486SX/25) and Wisp
works great.

You will need some antenna tracking hardware/software (I wrote my own for
the Mac).

2130. Kansas City Tracker/New AEA Tracker

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 15:51:36 UTC
From: Ken Terry <ken_terry@macmail.eng.gulfaero.com>
Message-ID: <3cpom8INNhdd@gulfaero.com>
Source record: 26084

I am getting the Yaesu model G-5400B rotor system, and I am trying to choose a PC driver for the rotor. I have heard of the Kansas City Tracker, and the new AEA Tracker. I am using this for tracking NOAA weather satellites and receive the HRPT signals. Any advice here on a good Az/El driver would be appreciated!

Ken
ken_terry@macmail.eng.gulfaero.com

2131. Re: Best multi mode dual band for satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 16:24:21 UTC
From: Jeffrey Smith <jsmith@fox.nstn.ca>
Message-ID: <57321.jsmith@fox.nstn.ca>
Source record: 26085

On Sat, 10 Dec 1994 10:54:58,
Bill Vaughn <billv@olympus.net> wrote:

>Just checking. What is the best mmdb rig for satellite comms I am leaning
>towards the new icom has anyone used this puppy yet?

I would like to hear about this radio as well. Looking at it also.
--
Jeffrey Smith
jsmith@fox.nstn.ca

2132. Re: MIR voice cntct foiled by jerk!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 18:04:45 UTC
From: Gerald Schmitt <ggs@aerie.lanl.gov>
Message-ID: <3cq0qb$duo@newshost.lanl.gov>
Source record: 26086

Put your TNC in traceon and passallon modes and listen you should
get the call of the offending station that way. Perhaps a gentle
explanation of his sins will cause a change in ways if not pin
his coax. We had a guy on local packet with the call "nocall".
He just didn't know how to set up the TNC and apparently didn't
have anyone to ask he was a bit harder to track. Good luck 73 Jerry
KC5EGG often on 10 and 13

2133. Re: Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 20:27:23 UTC
From: Sean Sharkey <sean@g0oanint.demon.co.uk>
Message-ID: <9412152027230030@g0oanint.demon.co.uk>
Source record: 26087

In article <rparsons-1512940912330001@slip203.bga.com>, Ronald G.
Parsons writes:

> I am wondering if anyone in this newsgroup has operated the
>microsats using a Macintosh computer,

Try having a look in

ftp.demon.co.uk /pub/ham/mac

you'll find a couple of shareware sat tracking programmes
and also things like Broadcast, EZ Dove, etc etc.

Regards, Sean.

2134. Re: Pentiums and IT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 22:25:11 UTC
From: rdcole@crl.com
Message-ID: <3cqfo7$3l8@crl8.crl.com>
Source record: 26088

Carr (carrl@gordon-tsd1.ARmy.MIL) wrote:
: A friend of mine has an HP Pentium 60Mhz machine that has problem
: running Instant Track... it will run the software but numbers and
: video are distorted.... anyone have a similar problem?
: carrl@gordon-tsd1.army.mil

I have the same problem. I figured it was related to the PCI localbus
video card. IT runs fine on the laptop nad the old 386. I have not
looked any further into the video problem. If you find a solution please
post it here on the net.

Ron Cole Internet:rdcole@crl.com ICBM:29 31.03 N
N5HYH CIS:70325,102 98 25.55 W
CE KZEP/KHBL AX25:N5HYH @ K3WGF.STX.NA
WWW Homepage URL=ftp://ftp.crl.com/users/ro/rdcole/rdc.html

2135. Locking on to pacsats with TAPR modem.

Newsgroup: rec.radio.amateur.space
Date: 1994-12-15 22:55:48 UTC
From: wk@muscle.frc.maf.govt.nz
Message-ID: <WK.94Dec16115548@muscle.frc.maf.govt.nz>
Source record: 26089

Thanks for reading this note. I have noticed that my kitset TAPR PSK modem has trouble locking on to the 1200 bps PSK sats.

In particular with AO16 there are 3 ways to tune into the signal causing the TAPR modem PLL circuit to lock. With attended operation, this is not much of a problem, I disable the AFC, fiddle the tuning control until the buzz sounds right and the PLL has captured the 1600 Hz carrier, flick the AFC back and all is sweet.

When unattended however, I leave the downlink RX 3 kHz below the AOS frequency, the sat pops up, dopplers down, the modem captures the carrier tone wrongly (too high) and tracks it all the way down to LOS without copying a single frame.

Could this have something to do with the fact AO16 uses raised cosine (how does this work anyway, what are the benefits?) IO26 does not have this problem of multiple lock points, but LO19 has, although to a lesser degree than AO16. Also, LO19 can be copied with half an S unit less than AO16 and as far as I am aware does not use raised cosine. Any suggestions on how to fix this problem are appreciated.

Wilbert, Zl2BSJ

--
Wilbert Knol, Acoustics Group, MAF Marine Research, Wellington, New Zealand.
Usenet:wk@frc.maf.govt.nz packet:ZL2BSJ@ZL2WA.NZL.OC or @ AO16, LO19
AMPR:[44.147.180.88] AX25 NET/ROM TCP/IP MBX 146.625 147.075 MHz 24 hrs.

2136. Re: Locking on to pacsats with TAPR modem.

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 03:22:05 UTC
From: n7ryw@teleport.com
Message-ID: <3cr139$k27@desiree.teleport.com>
Source record: 26090

In article <WK.94Dec16115548@muscle.frc.maf.govt.nz>,
wk@muscle.frc.maf.govt.nz said...

>In particular with AO16 there are 3 ways to tune into the signal
>causing the TAPR modem PLL circuit to lock. With attended operation,
>this is not much of a problem, I disable the AFC, fiddle the tuning
>control until the buzz sounds right and the PLL has captured the 1600
>Hz carrier, flick the AFC back and all is sweet.

This is normal. The nature of PSK is that there are quite a few signals
that the modem can lock on to, but only one is the right one. Raised
Cosine helps this to some extent by reducing the unwanted signals some,
but they are still there.

The best way to deal with this is to pre-tune the radio to the right
frequency before the pass. The Kansas City Tracker and Track Box will
both do this, as well as allow for the tuning inputs during the pass to
keep it in lock. These have the benefit of also tuning the uplink
frequency, which helps quite a bit.

Or, you can simply tune the receiver yourself at the beginning of each
pass.
From Bill, n7ryw@teleport.com

2137. Re: Best multi mode dual band for satellites?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 03:24:11 UTC
From: n7ryw@teleport.com
Message-ID: <3cr176$k27@desiree.teleport.com>
Source record: 26091

In article <57321.jsmith@fox.nstn.ca>, jsmith@fox.nstn.ca said...
>
>On Sat, 10 Dec 1994 10:54:58,
>Bill Vaughn <billv@olympus.net> wrote:
>
>>Just checking. What is the best mmdb rig for satellite comms I am
leaning
>>towards the new icom has anyone used this puppy yet?
>
>I would like to hear about this radio as well. Looking at it also.

This sounds familiar! I have an 820 for my boat, and a 736 at home. The
Yaesu is definitely superior for Sat use, and a lot better buy, as well,
with the built in power supply.
--
From Bill, n7ryw@teleport.com

2138. Re: Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 03:29:19 UTC
From: n7ryw@teleport.com
Message-ID: <3cr1gq$k27@desiree.teleport.com>
Source record: 26092

In article <rparsons-1512940912330001@slip203.bga.com>, rparsons@bga.com said...

>Windows is such a dog that Wisp use was not successful.

Really? I have been running Wisp with Windows since it came out with excellent results. Sure it's not the "Soft PC" that's the dog?

>I added the DOS Compatibility Card (486SX/25) and Wisp
>works great.

Wisp works very good on the platform it was designed for.

>You will need some antenna tracking hardware/software (I wrote my own for
>the Mac).

The Track Box uses only a serial port. If the Card you mentioned can access it, it will work very goos with Wisp, which has its own tracking and scheduling that is far superior to any others available.
--
From Bill, n7ryw@teleport.com

2139. Kansas City Tracker: over 360 az drive?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 13:12:50 UTC
From: brax@ava.hut.fi
Message-ID: <brax.2.2EF19252@ava.hut.fi>
Source record: 26093

In article <n7ryw.62.0000AC6B@teleport.com> n7ryw@teleport.com (William Roth) writes:

>The latest greatest, though, is the Windows KCT Driver by David Hoatson. If
>your computer has Windows, this and Wisp is the way to go by far!

Does this greatest one handle azimuth rotation over the one full turn that is limiting the use of the KCT? I mean, many azimuth rotator systems like the Yaesu G1000S have an overlap of 90 degrees, but it's useless in automated tracking because the driver program doesn't recognize it.

Matti Brax
Helsinki University of Technology
Lab. of Space Technology

2140. Just heard mir packet and a question....

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 14:45:04 UTC
From: tomsunman@aol.com
Message-ID: <3cs95g$kb@newsbf02.news.aol.com>
Source record: 26094

Mir just made a pass over my area and will make several more
tonight. I just heard packet bursts on 145.550! I can't wait for my radio
cable to come so I can attempt to connect. Whats the connect callsign for
Mir currently? Their back on the air over the U.S. apparently! Also,
What's the shuttle uplink packet freq? I've heard it's 144.490. I know the
downlink is 145.550 (same as Mir).
Another Mir pass will occure at 01:55 ut over Dutchess county, N.Y.

Tom, KB2SMSTom Randall, KB2SMS
Member: AAVSO Solar Division

2141. Mir packet heard!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 14:48:07 UTC
From: tomsunman@aol.com
Message-ID: <3cs9b7$183@newsbf02.news.aol.com>
Source record: 26095

Mir just made a pass over my area and will make several more tonight 12/15/94. I just heard packet bursts on 145.550! I can't wait for my radio cable to come so I can attempt to connect. Whats the connect callsign for Mir currently? Their back on the air over the U.S. apparently! Also, What's the shuttle uplink packet freq? I've heard it's 144.490. I know the downlink is 145.550 (same as Mir).
Another Mir pass will occure at 01:55 ut over Dutchess county, N.Y.

Tom, KB2SMS

2142. test

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 15:37:45 UTC
From: cjam@msg.ti.com
Message-ID: <3csc89$ibt@tilde.csc.ti.com>
Source record: 26096

```
Test
```

2143. Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 15:41:27 UTC
From: dkelly@nebula.tbe.COM
Message-ID: <9412161541.AA22129@nebula.tbe.com>
Source record: 26097

> If you can't answer my first question, I'd like to hear of *any*
> experiences, good or bad, running DOS or Windows programs on a Mac or
> PowerPC.

Well, SoftWindows seems to work on my PowerMacintosh 8100. I've run
Solitaire and Mine Sweeeper. Then dug up a 1987 edition of Norton SI
and got a 47.1 rating. Interesting when my 486DX33 rates 50 with the
same code.

Also I have run "rawrite.exe" under SoftPC in order to create Linux
bootdisks. Now the PC has a real operating system.

The 8100 appears to emulate 68k code 3x faster than my 33 MHz 68030
Macintosh IIvx ran native. My PCB fat binary autorouter runs 30x faster
native PowerMac than native 68k. I'm impressed. My Mac IIvx will get
a 7100 upgrade early next year.

73, David N4HHE
dkelly@nebula.tbe.com

2144. What is TheFIRMWARE?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 15:46:38 UTC
From: rubenc@iglou.iglou.com
Message-ID: <D0wuHr.MyG@iglou.com>
Source record: 26098

Could anyone tell me what TheFirmware is, and where it can be obtained?
I see it listed in the options for WISP. What hardware is required to use it?
Thanks.

Charlie KB8BWE
rubenc@iglou.com

2145. Re: 95 STS Schedule

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 15:56:14 UTC
From: n7ryw@teleport.com
Message-ID: <3csd9a$p0t@desiree.teleport.com>
Source record: 26099

In article <89F9570.14E6000042.uuout@freddy.supernet.ab.ca>,
ernie.koch@freddy.supernet.ab.ca said...
>
>-> >I am looking for a 1995 space shuttle schedule. Anyone know where I
>-> >could find it?

There was a manifest posting recently in sci.space.shuttle
There is uaually a lot of good discussion on everything Shuttle there.
--
From Bill, n7ryw@teleport.com

2146. Re: Pentiums and IT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 20:17:49 UTC
From: jhulten@saul2.u.washington.edu
Message-ID: <3cssld$giv@news.u.washington.edu>
Source record: 26101

Ron Cole (rdcole@crl.com) wrote:
: Carr (carrl@gordon-tsd1.ARmy.MIL) wrote:
: : A friend of mine has an HP Pentium 60Mhz machine that has problem
: : running Instant Track... it will run the software but numbers and
: : video are distorted.... anyone have a similar problem?
: : carrl@gordon-tsd1.army.mil

: I have the same problem. I figured it was related to the PCI localbus
: video card. IT runs fine on the laptop nad the old 386. I have not
: looked any further into the video problem. If you find a solution please
: post it here on the net.

Intel has officially annouced problems with their Pentium
Microprocessors. It seems that they cannot perform floating-point
division correctly. It isn't the video it's NEW MATH! ;)

Joke heard recently...

Why didn't Intel call the Pentium a 586?

Because they added 486 + 100 and got 585.99999275439!

==========
Jeffrey E. Hulten N7YHL jhulten@stein.u.washington.edu
Computer Specialist - Sociology Univ. of Washington (54)3-5882 DK-40
==========

: ----------
: Ron Cole Internet:rdcole@crl.com ICBM:29 31.03 N
: N5HYH CIS:70325,102 98 25.55 W
: CE KZEP/KHBL AX25:N5HYH @ K3WGF.STX.NA
: WWW Homepage URL=ftp://ftp.crl.com/users/ro/rdcole/rdc.html
: ----------

--
==========
Jeffrey E. Hulten N7YHL jhulten@stein.u.washington.edu
Computer Specialist - Sociology Univ. of Washington (54)3-5882 DK-40
==========

2147. C traking routines

Newsgroup: rec.radio.amateur.space
Date: 1994-12-16 21:37:41 UTC
From: s2902081@techst02.technion.ac.il
Message-ID: <D0xAqt.F3A@discus.technion.ac.il>
Source record: 26100

[No readable article body recovered]

2148. Re: NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 02:07:39 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D0xn8r.Lqx@netcom.com>
Source record: 26102

James Carter (jcarter@orl.mmc.com) wrote:
: I was watching NASA-SELECT TV this morning at 4am eastern.
: They had live coverage oc the NOAA-J launch. There was a hold
: at about 4:04 am and I had to leave so I missed the rest. There
: was a problem with something related to a gyro. Launch time was
: set at 4:02 am eastern with a 10 min window. Did they get it off
: in the window?

Launch is scrubbed til Dec. 20th.

Bill Eareckson
eareckso@netcom.com

2149. Re: Just heard mir packet and a question....

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 04:23:55 UTC
From: gerry@cs.tamu.edu
Message-ID: <3ctp4r$nul@news.tamu.edu>
Source record: 26103

In article <3cs95g$kb@newsbf02.news.aol.com>,
TOM SUNMAN <tomsunman@aol.com> wrote:
> Mir just made a pass over my area and will make several more
>tonight. I just heard packet bursts on 145.550! I can't wait for my radio
>cable to come so I can attempt to connect. Whats the connect callsign for
>Mir currently? Their back on the air over the U.S. apparently! Also,
>What's the shuttle uplink packet freq? I've heard it's 144.490. I know the
>downlink is 145.550 (same as Mir).
>Another Mir pass will occure at 01:55 ut over Dutchess county, N.Y.

Mir operates as R0MIR on 145.55 SIMPLEX. THe Shuttle, when it's carrying
SAREX uplinks packet on 144.49, and voice on 144.91, .93, .95, .97, and .99...
random selection of uplinks, with the downlink continuing on 145.55.

When the SAREX gear is on in Packet Robot Mode, it's callsign is W5RRR-1.

We sould suggest you keep the retries count down, and just keep reinitiating
it if necessary. Also: It's _not_ necessary to get multiple contacts. One's
plenty for the QSL, per mission. Please let the others try to get their
confirmation.

73, gerry
--
Gerry Creager N5JXS * SAREX Co-Investigator
gerry@cs.tamu.edu * A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov * to astronauts, and smile
****

2150. Shuttle Listening Confirmations?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 13:39:04 UTC
From: btbanko@prairienet.org
Message-ID: <3cuplo$6jp@vixen.cso.uiuc.edu>
Source record: 26104

During the September mission, I copied direct voice and packet from the shuttle. I sent in listening reports to the ARRL (who was supposed to be handling the SWL & QSLs), and I still haven't gotten my confirmation. I included a SASE, and in fact sent two separate SWL reports.

Has anybody else received QSLs or SWL confirmations for that mission? Am I wrong in thinking that an SWL rates a confirmation?

How long might it be before these confirmations come out?

Thanks & 73! de kb8cne

--
Brad Banko
Rockford, Illinois
btbanko@prairienet.org
Amateur packet radio: kb8cne@n9hkm.il.usa.na

2151. ARLK055 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 19:03:03 UTC
From: w1aw@arrl.org
Message-ID: <$arlk055.1994@ampr.org>
Source record: 26108
Cross-posted to: rec.radio.amateur.space,rec.radio.info

```
SB KEP @ ARL $ARLK055
ARLK055 Keplerian data

ZCZC SK23
QST de W1AW
Keplerian Bulletin 55 ARLK055
>From ARRL Headquarters
Newington, CT December 17, 1994
To all radio amateurs

SB KEP ARL ARLK055
ARLK055 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83058B 94342.88279490 -.00000456 00000-0 10000-3 0 3297
2 14129 26.7165 294.0511 6026754 234.0248 54.4343 2.05884896 58412
RS-10/11
1 18129U 87054A 94347.13465287 .00000025 00000-0 11212-4 0 9974
2 18129 82.9245 196.5750 0010223 248.4139 111.5920 13.72345559374451
UO-11
1 14781U 84021B 94344.54869808 .00000138 00000-0 31154-4 0 7592
2 14781 97.7812 350.9843 0012981 66.6086 293.6482 14.69281118576207
RS-12/13
1 21089U 91007A 94345.69695471 .00000051 00000-0 37930-4 0 7607
2 21089 82.9241 239.7984 0029250 337.3104 22.6760 13.74051159193023
AO-13
1 19216U 88051B 94345.62747239 -.00000353 00000-0 10000-4 0 9993
2 19216 57.6449 215.4691 7249810 356.8485 0.5285 2.09724541 18232
UO-14
1 20437U 90005B 94347.22641693 .00000013 00000-0 21877-4 0 590
2 20437 98.5824 69.4942 0011756 28.2239 331.9584 14.29867484255170
AO-16
1 20439U 90005D 94346.78540777 .00000037 00000-0 31286-4 0 8570
2 20439 98.5919 70.4927 0012091 30.1839 330.0037 14.29921577255125
DO-17
1 20440U 90005E 94347.21205143 .00000037 00000-0 31373-4 0 8584
2 20440 98.5915 71.3007 0012192 27.8606 332.3230 14.30062104255202
```

```
WO-18
1 20441U 90005F 94346.84082757 .00000037 00000-0 31324-4 0 8617
2 20441 98.5893 70.9211 0012627 30.2017 329.9894 14.30034934255159
LO-19
1 20442U 90005G 94347.22661127 .00000033 00000-0 29695-4 0 8574
2 20442 98.5939 71.6073 0013044 27.7857 332.4030 14.30133911255226
FO-20
1 20480U 90013C 94343.24811056 -.00000040 00000-0 -97952-5 0 7538
2 20480 99.0642 102.2153 0540291 303.1749 51.8612 12.83228108226589
AO-21
1 21087U 91006A 94347.10261029 .00000093 00000-0 82657-4 0 5475
2 21087 82.9420 10.3026 0034479 307.7168 52.0760 13.74548790194165
UO-22
1 21575U 91050B 94342.21814385 .00000045 00000-0 29604-4 0 5629
2 21575 98.4197 53.0513 0008084 124.3098 235.8854 14.36947493178072
KO-23
1 22077U 92052B 94346.28936609 -.00000037 00000-0 10000-3 0 4568
2 22077 66.0809 267.0811 0014546 244.7501 115.2012 12.86289730109690
KO-25?
1 22830U 93061H 94343.17959792 .00000084 00000-0 51126-4 0 3610
2 22830 98.5388 52.5264 0012392 25.7336 334.4461 14.28075601 62675
KO-25
1 22828U 93061F 94347.17237181 .00000033 00000-0 30725-4 0 3326
2 22828 98.6350 61.1275 0010897 35.4891 324.7018 14.28079427 31320
IO-26
1 22826U 93061D 94347.20311612 .00000020 00000-0 25750-4 0 3531
2 22826 98.6389 61.1332 0010147 47.9801 312.2227 14.27751260 63231
AO-27
1 22825U 93061C 94347.16518383 .00000035 00000-0 32115-4 0 3550
2 22825 98.6382 61.0297 0009549 46.8670 313.3308 14.27645155 63224
PO-28
1 22829U 93061G 94343.18738547 .00000045 00000-0 35926-4 0 3462
2 22829 98.6359 57.2096 0011017 46.3522 313.8567 14.28054835 62670
Mir
1 16609U 86017A 94346.22577564 .00004911 00000-0 70282-4 0 8658
2 16609 51.6489 14.9686 0002569 16.2070 343.9004 15.58208410503767

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
December 20, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

2152. Re: Microsats with a Macintosh computer

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 21:48:07 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <rlong-171294164525@slip3-25.acs.ohio-state.edu>
Source record: 26105

In article <3cr1gq$k27@desiree.teleport.com>, n7ryw@teleport.com (William Roth) wrote:

>
> The Track Box uses only a serial port. If the Card you mentioned can
> access it, it will work very goos with Wisp, which has its own tracking
> and scheduling that is far superior to any others available.
> --
> From Bill, n7ryw@teleport.com

SatTrak IV, a standalone tracker/tuner will also work.
It has WiSP support built-in etc.

Contact Kiron Corp 614-481-0542
or me: w8gus@amsat.org will do.

Ron.

2153. Re: Pentiums and IT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 21:49:55 UTC
From: rlong@magnus.acs.ohio-state.edu
Message-ID: <rlong-171294164759@slip3-25.acs.ohio-state.edu>
Source record: 26106

In article <9412141410.AA07489@gordon-tsd1.army.mil>,
carrl@gordon-tsd1.ARmy.MIL (Carr) wrote:

> A friend of mine has an HP Pentium 60Mhz machine that has problem
> running Instant Track... it will run the software but numbers and
> video are distorted.... anyone have a similar problem?
> carrl@gordon-tsd1.army.mil

This has been discussed on amsat-bb@amsat.org.
Contact w0sl@amsat.org (Roy) who is gathering
information. Some people report no problem.
Others do.
Ron w8gus.

2154. Where am I?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-17 23:00:03 UTC
From: brent@network.ucsd.edu
Message-ID: <3cvqhj$kqr@network.ucsd.edu>
Source record: 26107

This may or may not be a good place to ask this, but it's sort of satellite related... Does anyone know of a celestial navigation program either on the market or available via FTP?

Please email, as it is not always easy to check news from this part of the world...

Thanks,
Brent

--
Brent Jones
Amundsen-Scott South Pole Station
90 Degrees South Latitude, Antarctica
brent@fred.spole.gov

2155. Wanted: OFS WeatherFax Board

Newsgroup: rec.radio.amateur.space
Date: 1994-12-18 03:47:21 UTC
From: DVRobson@ix.netcom.com
Message-ID: <3d0bc9$9rj@ixnews2.ix.netcom.com>
Source record: 26109

Anyone wishing to sell an Wanted: OFS WeatherFax Board please send me a message

Thanks

David V. Robson
Danville CA

2156. APRS & GPS

Newsgroup: rec.radio.amateur.space
Date: 1994-12-18 21:59:14 UTC
From: rtomo@i-2000.com
Message-ID: <3d2bbi$e37@i-2000.com>
Source record: 26110

Does anyone have info and/or programs to get involved with APRS or GPS system operating on 145.79?
Please respond to:

rtomo@i-2000.com

Please DO NOT Post replies. Just E-Mail. TNX

73, Ron
KE2UK

~~~~~~
Ronald A. Tomo, M.P.A., C.S.P.
Project Coordinator, Information Services, EHS
Res. (718) 251-1986 Voice & FAX - Off. (516) 228-6273
Internet: rtomo@i-2000.com & ke2uk@panix.com
Compuserve: 71615,1330
~~~~~~

2157. Re: Where am I?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 02:50:57 UTC
From: miles@mail.utexas.edu
Message-ID: <miles-1812942050570001@slip-5-4.ots.utexas.edu>
Source record: 26261

In article <3cvqhj$kqr@network.ucsd.edu>, brent@network.ucsd.edu (Brent Jones) wrote:

> This may or may not be a good place to ask this, but it's sort of
> satellite related... Does anyone know of a celestial navigation program
> either on the market or available via FTP?

I will post and e-mail this reply: The newsgroup rec.boats is a good place to ask.

2158. APT-Satellites: Report DEC 17, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 08:21:38 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-191294092110@oskar.gmd.de>
Source record: 26262

```
Observed 50.61 deg NLat, 7.55 deg ELon; DEC 17, 1994

Following the satellite-name you read the approx.
hour (local=sun-time) and motion-direction of the
pass (N=northbound, S=southbound).
This time +/-1.5h is valid for the next 10+ days
to expect the satellite to be visible in range of
northern-hemisphere-stations, add 11h and switch
S<->N for another pass to observe.

NOAA-9 10:S APT 137.62 MHz On
NOAA-10 17:N APT 137.50 MHz *OFF*
NOAA-11 16:N APT 137.62 MHz AVHRR dead
NOAA-12 18:N APT 137.50 MHz On
Meteor 2-21 10:S APT 137.85 MHz On
Meteor 3-5 18:N APT 137.85 MHz *OFF*
OKEAN 1-7 09:N APT 137.40 MHz *OFF*

APT of OKEAN 1-7 was off during all available
passes. NOAA-11 imaging is dead, burst and timing
signals are active. Meteor 2-21 is the only active
russian APT-bird, signal is weak (antenna-boom not
deployed?). NOAA-10 is in standby-mode, no APT. No
other APT-signal 136.00-137.99 MHz 07:30-20:00 UT.
Lauch of NOAA-J is delayed until DEC 28.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

2159. Re: Pentiums and IT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 11:57:38 UTC
From: aranders@kosepc01.delcoelect.com
Message-ID: <3d3sfi$ji4@kocrsv08.delcoelect.com>
Source record: 26268

Carr (carrl@gordon-tsd1.ARmy.MIL) wrote:
> A friend of mine has an HP Pentium 60Mhz machine that has problem
> running Instant Track... it will run the software but numbers and
> video are distorted.... anyone have a similar problem?

"Numbers...are distorted" ???

In <3cssld$giv@news.u.washington.edu>,
jhulten@saul2.u.washington.edu (Jeffrey Hulten) writes:
> Intel has officially annouced problems with their Pentium
> Microprocessors. It seems that they cannot perform floating-point
> division correctly. It isn't the video it's NEW MATH! ;)

Just for accuracy's sake, Pentiums (Pentia?) *can* do floating-point
division correctly. Unfortunately, they also can do it wrong.
Specific divisors cause the CPU to use incorrect entries in a lookup
table, a problem that has already been fixed in the chips now being
manufactured.

I see your smiley, but I have to say it anyway: The Pentium Flaw (tm)
(Intel insist it's a Flaw, not a Bug) should not have anything to do
with distorted video. I've never heard of a video driver that used
floating point calculations.

= === === === = = = === === === === = = === = = = === = = === =
Alan Anderson | Ignorance can be fixed,
(I speak AT, not FOR, Delco Electronics) | but stupidity is permanent.

2160. Re: Pentiums and IT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 14:20:23 UTC
From: stephens@gdim.geod.emr.ca
Message-ID: <1994Dec19.142023.11233@emr1.emr.ca>
Source record: 26263

```
Jeffrey Hulten (jhulten@saul2.u.washington.edu) wrote:
: Ron Cole (rdcole@crl.com) wrote:
: : Carr (carrl@gordon-tsd1.ARmy.MIL) wrote:
: : : A friend of mine has an HP Pentium 60Mhz machine that has problem
: : : running Instant Track... it will run the software but numbers and
: : : video are distorted.... anyone have a similar problem?
: : : carrl@gordon-tsd1.army.mil

: : I have the same problem. I figured it was related to the PCI localbus
: : video card. IT runs fine on the laptop nad the old 386. I have not
: : looked any further into the video problem. If you find a solution please
: : post it here on the net.

: Intel has officially annouced problems with their Pentium
: Microprocessors. It seems that they cannot perform floating-point
: division correctly. It isn't the video it's NEW MATH! ;)

: Joke heard recently...

: Why didn't Intel call the Pentium a 586?

: Because they added 486 + 100 and got 585.99999275439!

: ===========================================================================
: Jeffrey E. Hulten N7YHL jhulten@stein.u.washington.edu
: Computer Specialist - Sociology Univ. of Washington (54)3-5882 DK-40
: ===========================================================================

:
:

: : ---------------------------------------------------------------------
: : Ron Cole Internet:rdcole@crl.com ICBM:29 31.03 N
: : N5HYH CIS:70325,102 98 25.55 W
: : CE KZEP/KHBL AX25:N5HYH @ K3WGF.STX.NA
: : WWW Homepage URL=ftp://ftp.crl.com/users/ro/rdcole/rdc.html
: : ---------------------------------------------------------------------

: --
: ===========================================================================
: Jeffrey E. Hulten N7YHL jhulten@stein.u.washington.edu
: Computer Specialist - Sociology Univ. of Washington (54)3-5882 DK-40
: ===========================================================================

:

--
Dave Stephenson
```

Geological Survey of Canada *Too much bad arithmetic is not a *
Ottawa, Ontario, Canada *substitute for not enough good *
Internet: stephens@geod.emr.ca * mathematics *

2161. Need Sat Tracking for Commodore 64/128

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 19:11:38 UTC
From: ki7zd@chinook.halcyon.com
Message-ID: <3d4lta$4ai@news.halcyon.com>
Source record: 26265

A fellow amateur is in need of Sat tracking software for a c64/128 computer.

Can someone point me to the correct ftp site? Or any other means of
obtaining this software?

N7TET and myself thank you!

--
/-/-/ ~~~~~~
| Amateur Radio Station Inet: ki7zd@halcyon.com
| KI7ZD
| WWA CN87 73's _._ .. __... __.. _.. "If RST > 519, Reduce Power!"

2162. Microsats via Internet???

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 19:42:38 UTC
From: exuward@exu.ericsson.se
Message-ID: <3d4nne$9ud@cnn.exu.ericsson.se>
Source record: 26264

I'm not a ham, but my dad is. He spends a lot of time at sea around Guam and Saipan. He has a tracking system set-up and communicates regularly with these Microsats.

My question is... Is there a tracking system with a gateway to the internet? Something that might download all the files out of the satellite's queue. Look for some code that meant the file was an e-mail message and who the recipient was, then mail it. Likewise you could mail to some station's e-mail address, embed a call-sign and satellite in the subject. Next time the satellite passes over, your message would be uploaded.

If nothing like this exists, it sounds like a fun project that I'd like to work on.

--Jerry.

2163. Re: Microsats via Internet???

Newsgroup: rec.radio.amateur.space
Date: 1994-12-19 21:51:03 UTC
From: rdcole@crl.com
Message-ID: <3d4v87$eqa@crl.crl.com>
Source record: 26266

Gerald Ward (exuward@exu.ericsson.se) wrote:

: I'm not a ham, but my dad is. He spends a lot of time at sea around
: Guam and Saipan. He has a tracking system set-up and communicates
: regularly with these Microsats.

: My question is... Is there a tracking system with a gateway to the
: internet? Something that might download all the files out of the
: satellite's queue. Look for some code that meant the file was an
: e-mail message and who the recipient was, then mail it. Likewise
: you could mail to some station's e-mail address, embed a call-
: sign and satellite in the subject. Next time the satellite passes
: over, your message would be uploaded.

Jerry,
You need to locate one of the packet satellite gateway stations,
you dad should be able to do that. Then have them set up a routiong
table for messages between your dad and your mail account. The Packet /
Internet gateway in that area would handle routing the message to E-mail
once the Satellite staiton downloads the message.

Ron
n5hyh@sat.ampr.org

2164. Re: NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-20 02:22:33 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D137xL.Muu@netcom.com>
Source record: 26267

: Launch is scrubbed til Dec. 20th.

--Now postponed to Dec. 28th. This is getting old!

Bill Eareckson
eareckso@netcom.com

2165. RS-12 Users

Newsgroup: rec.radio.amateur.space
Date: 1994-12-20 11:55:00 UTC
From: dennis.morris@totrbbs.atl.ga.us
Message-ID: <106.13.uupcb@totrbbs.atl.ga.us>
Source record: 26269

Hello, Fellow RS-12 Users! All of the attention is directed to VHF/UHF bird chasers, so I though I would open some dialog with fellow Mode K users. I have a few hints that might enhance your operating..and I'm sure you have some even better ideas. Look forward to hearing from you via UseNet or via Internet: dennis.morris@totrbbs.atl.ga.us
73 and Happy Holidays..see you next orbit! Dennis

Top Of The Rock BBS - Lilburn, GA SYSOP: Steve Diggs
UUCP: totrbbs.atl.ga.us Snailmail: 4181 Wash Lee Ct.
Phone: +1 404 921 8687 Lilburn, GA 30247-7407

2166. Minimum $$$ for satellite work?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 01:05:16 UTC
From: arthurc@crl.com
Message-ID: <3d7v0c$b5t@crl.crl.com>
Source record: 26270

Greetings! Hope folks here can help me/us out:
My son has an Icom 2mm/70cm handheld, a packet modem and a Macintosh computer with an Internet connection.
What, in your view, is the minumum equipment he will need to purchase and/or download to have a satisfying experience with satellite tracking -- voice and/or packet?
Email or post = much appreciated!
73

2167. Re: Microsats via Internet???

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 02:09:36 UTC
From: exuward@exu.ericsson.se
Message-ID: <3d82p0$3hj@cnn.exu.ericsson.se>
Source record: 26271

Hi Ron,

Do you know where I can get a procedure on how to do this? I don't
think my dad knows how to locate a gateway. At sea, he's not in the normal
packet radio range so I don't know if there is anything in the "area".
He has a station and usually gets on ko-23, ko-25, ao-13, ao-20, and
some others.

Thanks,

Jerry.

2168. Need help w/ satellites

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 04:08:49 UTC
From: guarinoj@aspen.uml.edu
Message-ID: <1994Dec20.230849.1@aspen.uml.edu>
Source record: 26275

Would someone mind telling me how exactly one can track a satellite with a computer?
Use an outside satellite dish?
I dont know, but am interested in how this goes about happening..
Please emial at
Guarinoj@woods.uml.edu

also what are the benefits of amature satellite tracking?

thanks again?

2169. WTB: SURPLUS/OLD RADIOS

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 10:17:56 UTC
From: Dave AB5S/7 <72227.1640@CompuServe.COM>
Message-ID: <3d8vck$79c$9@mhadg.production.compuserve.com>
Source record: 26281

****

WANTED TO BUY

COLLECTOR/RESTORER WISHES TO PURCHASE

COMMAND SETS-- ARC-5, SCR-274N RADIOS

AND ACCESSORIES. ALSO BC348, BC375

AND TCS EQUIPMENT AND PARTS.

OLD CONTROL BOXES WANTED, INCLUDING

BC451A, BC442 AND THE LIKE,

MODULATORS MD-7 AND BC-456 AND ANY

OTHER RELATED ITEMS.

TOP DOLLAR PAID FOR CLEAN/UNMODIFIED

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SOME TRADES AVAILABLE. 32 MEGS

IN 72-PIN SIMMS, ETC.

REPLY TO: 72227.1640@COMPUSERVE.COM or

DLSTIN@EGG.NV.DOE.GOV

TNX ES 73 DE AB5S/7 DAVE STINSON

(702)656-3926

I am not a dealer, nor do I resell to

non-US persons.

****

2170. Keps for KO-25

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 13:21:42 UTC
From: seeler@UPEI.CA
Message-ID: <seeler.161.788015973@UPEI.CA>
Source record: 26283

Hi - With the recent decision to drop the old KO-25 assignment - I have a question as to the recent W1AW posting where it has KO-25 and KO-25? Which has the updated keps for the object now assumed to be KO-25?

Also - on archive.afit.af.mil - in amateur.tle - is the KO-25 kep listing for the object now assumed to be KO-25 OR is the data associated with the older object previously assumed to be KO-25.

The reason I ask is that I obtain my keps from archive..... and have in the past updated the KO-25 data from the arrl data.

Please send replies to seeler@upei.ca

73 Dave Seeler

2171. Re: Minimum $$$ for satellite work?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 17:19:46 UTC
From: rdcole@crl.com
Message-ID: <3d9o3i$3pb@crl9.crl.com>
Source record: 26272

Arthur Chandler (arthurc@crl.com) wrote:
: Greetings! Hope folks here can help me/us out:
: My son has an Icom 2mm/70cm handheld, a packet modem and a Macintosh
: computer with an Internet connection.
: What, in your view, is the minumum equipment he will need to purchase
: and/or download to have a satisfying experience with satellite tracking --
: voice and/or packet?
: Email or post = much appreciated!

Step 1: Go to the archives and download a satellite tracking program, not being a Mac person I don't know what avaiable but I know they are available.

Step 2: Get a new set of KEMPS, this news group carries them on a weekley basis or you can get them from the AMSAT, ARRL or the Soruce NASA.

Step 3: You can listen to Dove-17 on 2M FM and decode the packet beacons and listen to the voice. AO-20 or 21, I don't have my notes, Sometimes operates in a FM crossband repeater mode. I have worked it from my pickup while running down the road. There are some packet satellites that operate in regular 1200 baud FM, though most operate at 9600 baud PSK which requires a different radio than a HT.

Step 4: Here's the big step: Purchase 2m and 430 All mode Radios, I have a Yeasu, but Kenwood and Icom build them too. Purchase an "Oscar" packe dual Band Antenna system, I have the KLM, for Cushcraft and others build simular antennas, Then get an AZ/EL rotator to point the antennas. This is the basic system, Add Amplifiers of needed and a Computer/Rotator controler to auto track the bird and it becomes a real joy to operate the birds.

Ron Cole Internet:rdcole@crl.com ICBM:29 31.03 N
N5HYH CIS:70325,102 98 25.55 W
CE KZEP/KHBL AX25:N5HYH @ K3WGF.STX.NA
WWW Homepage URL=ftp://ftp.crl.com/users/ro/rdcole/rdc.html

2172. PACSAT info sources and software

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 17:47:38 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <28819.9412211747@vermeer.ecs.soton.ac.uk>
Source record: 26273
Body handling: HTML body converted to readable text

Hi there,

I am looking for the latest PACSAT related information sources. Are
there any ftp site or web pages or email addresses for this matter?

I am new to packet radio communications to start with. But I am
interested in collected data from the PACSATs. So I wish to find out the
answers for the following basic questions:

1. Are these satellites PACSAT? UO-22, KO-23, KO-25, PO-28.
I am interested in these because they have FM downlink and is very
easy to track. Are there anymore PACSAT not listed above?
Or do all PACSAT have FM downlink at 9600 baud by definition?

2. I read the PACSAT documentation which was produced University of
Surrey a few years ago. It briefly mentioned UO-14 and UO-22. I
understand that these PACSATs worked in two mode: File Server and
Broadcast. I am interested in Broadcast specifically. I would like to
know if anybody has experience in working with the Broadcast mode of
these PACSATs.
Do KO-23 and KO-25 have the same Broadcast mode?

3. What I plan to do is to write a program for automatic collection of
the broadcast frames from the PACSATs. I understand that each broadcast
frame looks something like this:

0xbb

The procedures of my program are:

collect all broadcast frames from the PACSAT
save all the frames in a temporary file

process the temporary file
sort the frames
restore the PACSAT files
extract 'original' files from the PACSAT files

Has anyone written any programs or algorithms for all or part of the
procedures?

I understand that Surrey produced a program called PB. I would like to
be able to track and download frames from multiple PACSATs
automatically (unmanned for extended period of time).

4. About TNC and PC (serial port) interfacing. I used a Tiny-2 TNC with
a 9600 baud modem.

How many bps should the serial port speed be? Ideally it should be
faster than the 9600 downlink speed.
What is meant by KISS mode and AX.25 Unconnected mode used by the
PACSAT? Shall I set the TNC to KISS mode in order to receive the
frames from the PACSAT? Do frames and AX.25 Unconnected mode mean
the same thing?
On top of the frame received from the PACSAT, what headers and
trailers does the TNC add to it before sending it down the serial port
to the PC?

Thanks in advance,

Yours,
Liang S. Ng
Southampton

2173. Connected to MIR... Finally!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 17:50:05 UTC
From: jls@capedata.iii.net
Message-ID: <3d9pt0$51m@nic.iii.net>
Source record: 26274

Finally, after several days of trying, I connected to MIR.

I have now set up my dualbander for other ops.. IE: AO-10,
LO-19, etc. Can anyone tell me what call signs they use?
Is there a standard format from the Satellite designator?

Thanks.

Jeffery Stutzman
Packet: N1LUY@KQ1K.MA.USA.NOAM Buzzards Bay, Ma.
MANU TENERE MARE SUPREMUS

2174. AmSoft 1/95 CD-ROM Press Release 1

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 21:11:19 UTC
From: amsoft@epix.net
Message-ID: <3da5ln$t8k@grape.epix.net>
Source record: 26276

```
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CONTENTS OF THE AMATEUR RADIO SOFTWARE LIBRARY INCLUDED
ON THE JAN 1995 CALLSIGN v4 HAM RADIO CD-ROM BY AMSOFT

+AMCALL v1.1 LOGBOOK BY KC5JP USES THIS CD-ROM TO AUTO-LOG
+ANTENNA
ANT_01 AUTOMATIC RESONATING MOBILE ANTENNA
ANT_02 ANTENNA THEORY AND DESIGN
ANT_03 YAGI ANTENNA EVALUATION PROGRAMS BY N6BV
ANT_04 RFS ANTENNA TECHNICAL CALCULATOR
ANT_05 LOOP ANTENNA CALCULATOR BY WB2DYB
ANT_06 GUY WIRE CALCULATOR BY N6PE
ANT_07 HF RADIO ANTENNA DESIGNER V2.00
ANT_08 ANTENNA CALCULATOR BY K2TV
ANT_09 BEAM V2.1 GREAT CIRCLE CALCULATOR
ANT_10 YAGIMAX ANTENNA DESIGN BY K4UX
ANT_11 YAGICAD V4.1 BY VK3DIP
ANT_12 LONG WIRE ANTENNA CALCULATOR V1.00
ANT_13 MINI NEC BY KM4UL
ANT_14 DIPOLE DESIGN PROGRAM BY WA2ZIR
ANT_15 YAGISHWR V2.0 PHADEAN ENG. BY K1POO
ANT_16 ANTENNA DEMOS FROM PHADEAN ENG. BY K1POO
ANT_17 SLOPING VEE FROM PHADEAN ENG. BY K1POO
+BASIC A COLLECTION OF 86 AMATEUR RADIO PROGRAMS IN BASIC
+CAT
AOR_1 CONTROL YOUR AOR300
R8_1 R8 TUNER V2.0
R8_2 SMART R8 CONTROL V1.02
ICOM_01 ICOM PROGRAMMER BY N5MHZ
ICOM_02 RADIO REMOTE CONTROL PROGRAM FOR ICOM
ICOM_03 ICOM HF RADIO CONTROL PROGRAM
ICOM_04 ICOM IC-R7000 RECEIVER CONTROL PROGRAM
KEN_01 DIGI-COMM TS-850 RADIO CONTROL
KEN_02 RIG-EQF V2.10 KENWOOD RADIO CONTROL BY N3EQF
KEN_03 K-440 SPOILER V2.00 BY K5KNC
KEN_04 KENWOOD TS-940S INTERFACE CONTROLLER BY VE3COO
KEN_05 RADIO REMOTE CONTROL PROGRAM FOR KENWOOD RADIOS
KEN_06 HF440 TS-440 RADIO CONTROL V1.3 BY N7IPY
KEN_07 KENCON KENWOOD RADIO CONTROL BY KB3MY
KEN_08 KENW2OOD TS-440 RADIO CONTROL BY KB3MY
KEN_09 KENWOOD TS-440 RADIO CONTROL BY W9HXL
PROCAT GREAT ICOM AND YAESU CAT SOFTWARE BY WB8YQJ/6
SCANCAT VERSION 5.20 MULTI RADIO SUPPORT PROGRAM BY N5JMZ
YAESU_01 CATY767 V0.6 RADIO CONTROL PROGRAM BY N3HGQ
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YAESU_02 YAESU 757 GX MK II CAT PROGRAM BY N1AED
YAESU_03 FRG-9600 CAT CONTROL PROGRAM BY WB4HRH
YAESU_04 CAT980 V1.8 FT-980 CONTROL PROGRAM BY K5YEF
+CW
CW_01 QUICK MORSE V1.00
CW_02 S A M F B V5.0 CW TRAINING PROGRAM
CW_03 EZCODE V2.0 CW TRAINING PROGRAM
CW_04 CW V2.09 QSO SIMULATOR & CW TRAINING BY W5CID
CW_05 CW SEND & RECEIVE PROGRAM FOR IBM BY W1HKJ
CW_06 THE CODE MACHINE CW TRAINING PROGRAM
CW_07 MORSEMAN PLUS CW TRAINING PROGRAM BY NE4L
CW_08 SUPER EASY MORSE CW TRAINING PROGRAM BY AB4IF
CW_09 SUPER MORSE V4.10 CW TRAINING PROGRAM BY WD5CID
CW_10 AUTOCW CW TRAINING PROGRAM BY NM1D
CW_11 CW V1.04 CW TRAINING PROGRAM BY W0NFU
CW_12 MORSE CODE MEMORY KEYBOARD IN VISUAL BASIC
CW_13 DAHDIT V4.00 CW TRAINING PROGRAM
CW_14 INTERNATIONAL MORSE CODE TRAINER BY AC3L
CW_15 CW WITH QSO SIMULATOR CW TRAINING PROGRAM BY KC9X
CW_16 FFTMORSE MORSE CODE READER USING SOUNDBLASTER
CW_17 MORSE CW TRAINING PROGRAM BY N7CCB
CW_18 MORSE TUTOR CW TRAINING PROGRAM BY N0IAI
CW_19 CWSPEED v2.O SPEED MEASURING PROGRAM BY AE8G
+DX_CALLS
CANADA CANADIAN DATABASE & RETREIVAL SYSTEM FROM VE3PZR
CZECH REPUBLICS CALLSIGN DATABASE
RUSSIA DATABASE & RETREIVAL SYSTEM
TAIWAN ASCII CALLSIGN LIST
UNITED KINGDOM CALLSIGN DATABASE
+DIST_NET 435 HAM RADIO PROGRAMS FROM THE HAM DISTRIBUTION NET
+ENGINEER
AC_01 NETWORK V1.0 AC ELECTRONIC CIRCUIT ANALYSIS
AC_02 PC-ECAP V2.00 AC CIRCUIT ANALYSIS PROGRAM
AC_03 CAP FOR CALCULATING SERIES & PARALELL CAPACITORS
AC_04 FBN NETWORK AC SPECTRAL ANALYSIS TOOL
ANALOG_1 LAMB ANALOG DEVICES CATALOG
ANALOG_2 ANALOG-P RESISTANCE/INDUCTANCE/CAPACITANCE
ANALOG_3 P-SPICE PRENTICE-HALL STUDENT VERSION W/PROBE
CIRCAD v3.67b SCHEMATIC & PCB DEMO FROM WB0VNE
DC_01 RESISTOR A DC CALCULATOR FOR SERIES AND PARALELL CALC
EEPUB E.E. PUBLIC DOMAIN LIBRARIES COLLECTION OF SOFTWARE
LIB_01 LAMB PRECISION DECISIONS MONOLITHIC DEVICES CATALOG
LIB_02 IC DATABOOK V1.3
MOTOROLA MOTOROLA PARTS CATALOG V6.0
PCB_01 PC BREEZE II V2.1 PCB CAD DESIGN PROGRAM
PCB_02 PCROUTE V2.210 PCB CAD DESIGN PROGRAM
PCB_03 EDIT-PCB V2.0 PCB DESIGN PACKAGE
PCB_04 PCBCAD HAS TOOLS FOR DESIGN OF PRINTED CIRCUIT BOARDS
PHILLIPS HCMOS PHASE-LOCKED LOOP DESIGN PROGRAM BY PHILLIPS
RF_01 QCKT THE QUICK RF CIRCUIT ANALYZER V1.00

SCHEM_01 EDRAW EASY DRAW V3.2 SCHEMATIC DRAWING PROGRAM
SCHEM_02 SCHEMATIC FILER V2.1 SCHEMATIC DRAWING PROGRAM
SCHEM_03 LAYO CAD SCHEMATIC DRAWING PROGRAM WITH AUTOROUTING
SCHEM_04 SCHEMATIC PLUS V1.2 SCHEMATIC DRAWING PROGRAM
SCHEM_05 QUICKDRAW SCHEMATIC DRAWING PROGRAM
SCHEM_06 CKT DRAW V1.0 SCHEMATIC DRAWING PROGRAM
SCHEM_07 EDITSCH V2.0 SCHEMATIC DRAWING PROGRAM
SCHEM_08 SKEM V1.0 SCHEMATIC DRAWING PROGRAM
+EXAMS
ADV_01 LATEST EXAMINATION ELEMENTS FROM GHZ ENGINEERING
ALL_01 AA3C-HAMTUTOR V2.50 MULTI LICENSE CLASS EXAMS
ALL_02 QUIZ MULTI LICENSE CLASS EXAMS BY KB5GQO
ALL_03 HAMPAC V1.5 MULTI LICENSE CLASS EXAMS BY KB5DIX
ALL_04 AUTOEXAM MULTI LICENSE CLASS EXAMS BY NM1D
ALL_05 EXAM GENERATOR V2.0 MULTI CLASS EXAMS BY KB2FZH
ALL_06 AMATEUR RADIO STUDY GUIDE V1.0 MULTI CLASS EXAMS
ALL_07 FLASH CARD MULTI LICENSE CLASS EXAMS BY WA6SAL
ALL_08 N1GFQ FCC LICENSE EXAM STUDY ASSISTANT
ALL_09 HAMTEST MULTI LICENSE CLASS EXAMS BY AB5P
EXTRA_01 LATEST EXAMINATION ELEMENTS FROM GHZ ENGINEERING
GEN_1 LATEST EXAMINATION ELEMENTS FROM GHZ ENGINEERING
NOVICE LATEST EXAMINATION ELEMENTS FROM GHZ ENGINEERING
PART97_1 THE COMPLETE TEXT OF TITLE 47 CFR 97 RULES & REGS
PART97_2 HAMBONE V1.0 USES PART 97 TO BONE UP ON RULES & REGS
TECH_01 LATEST EXAMINATION ELEMENTS FROM GHZ ENGINEERING
VEC_01 VOLUNTEER EXAMINERS CODE EXAM GENERATOR V2.1 BY WA8YCD
+FORMULAS
DAVID COLLECTION OF ENGINEERING PROGRAMS BY DAVID ARMSTRONG
EEF ELECTRICAL & ELECTRONIC FORMULAS V2.02
ELEC_01 ELECALC ELECTRONICS BASIC CALCULATIONS
ELEC_02 ELECFORM USEFULL ELECTRONIC FORMULA ROUTINES
ELEC_03 ELECTRON V2.5 ELECTRICAL & ELECTRONIC CALCULATIONS
ELEC_04 THE ELECTRONIC COMPANION V1.01
ELEC_05 THE FORMULA BANK BY ELTECH
IRVINE ELECTRONICS CALCULATIONS PROGRAMS BY DAVID IRVINE
MATH SCIENTIFIC EQUASION SOLVER, SCIENTIFIC CALCULATOR
RF_01 SOME RFTOOLS #1 RF DESIGN TESTING FORMULA PROGRAMS
RF_02 SOME RFTOOLS #2 RF DESIGN TESTING FORMULA PROGRAMS
RF_03 RFS TECHNICAL PROGRAMS DISK V1.0
RF_04 TELEDYNE MICRO ELECTRONICS RF TOOLBOX
RF_05 BDS ENGINEERING TOOLKIT V2.0
RF_06 CALC V2.15 ELECTRONIC CALCULATIONS
RF_07 CHEBY V1.1B FILTER DESIGN PROGRAM
RF_08 LINELOSS CALCULATES LINELOSS ON TRANSMISSION LINES
RF_09 GAMMA CALCULATE YOUR GAMMA MATCHES BY WB0IKN & W7ITB
SOLVE V7.1a FOR AC/DC CIRCUITS & NETWORK CIRCUITS
+LOG
CON_01 AMATEUR RADIO LOGBOOK PACKAGE V3.5 BY G3ZCZ
CON_02 VHF TEST V2.30 4/94 CONTEST LOGBOOK BY WG3E
CON_03 CT V6.14 CONTEST LOGBOOK BY K1EA

CON_04 DUPE V2.6 CONTEST LOGBOOK
CON_05 FASTDUPE V1.0 CONTEST LOGBOOK BY WB2MAE
CON_06 LOGSHEET CONTEST LOG SHEET GENERATOR BY WB2MAE
CON_07 PCLOG CONTEST LOGBOOK BY VE3USA
CON_08 FIELDAY CONTEST LOGBOOK FOR FIELD DAY BY WA3FAE
CON_09 MICRO HAM TESTRIDE V4.02 CONTEST LOGBOOK
CON_10 FIELD DAY LOGGING SYSTEM V3.00 BY WR9R
CON_11 FIELD DAY LIGGING PROGRAM V4.00 BY W1HKJ
CON_12 PA LOGGER-1200d PA QSO PARTY LOGGER BY KM3D
COUNTY_1 COUNTY V1.2 AMATEUR RADIO LOGBOOK BY WB9SVH
DX_01 HYPERLOG V2.25 AMATEUR RADIO LOGBOOK BY AH8B/W4
DX_02 PXDB PREFIX DATABASE AMATEUR RADIO LOGBOOK
DX_03 ARS LOGBOOK/DXCC PROGRAM V4.2 BY KI6LO
DX_04 THE DXER V1.33 AMATEUR RADIO LOGBOOK BY WA6JOO
DX_05 HAMLOG AMATEUR RADIO LOGBOOK BY KE6DN
DX_06 DXCC AMATEUR RADIO LOGBOOK FOR DXCC AWARD TRACKING
DX_07 DXCC AWARD LOGGER AND LISTNER BY OH2DN & OH2BU
LOGMASTR WB2OPA LOGMASTER PLUS PLUS USES OUR CD-ROM
NET_01 NET-CONTROL V5.8 AMATEUR RADIO LOGBOOK BY VE3COO
NET_02 ROLL CALL V3.05 ROLODEX STYLE AMATEUR RADIO LOGBOOK
NTS_01 HAMGRAM NTS MESSAGE FORMAT FORM GENERATOR
NTS_02 NTS LOGGER VERSION 3.O BY BARBRA OSOFSKEY KB2HM
LOG_01 LOG-EQF V6.19 AMATEUR RADIO LOGBOOK BY N3EQF
LOG_02 THE TOTAL HAM V9.2 AMATEUR RADIO LOGBOOK BY WD4AZG
LOG_03 THE TOTAL HAM PLUS V8.1 HAM RADIO LOGBOOK BY WD4AZG
LOG_04 LOGGER V1.50 AMATEUR RADIO LOGBOOK BY KD2MT
LOG_05 HAM COMPUTER AMATEUR RADIO LOGBOOK BY WB8YQJ/6
LOG_06 LOGRPT AMATEUR RADIO LOGBOOK BY N5LDU
LOG_07 PC LOG AMATEUR RADIO LOGBOOK BY WB4UIH
LOG_08 SPLOG V3.01 ADVANCED AMATEUR RADIO LOGBOOK DATABASE
LOG_09 DZ-LOG USES INTERNET CALL SIGN DATABASE
+LOST & MISSING CHILDREN IMAGES FROM THE HEIDI SEARCH CENTER
+MAC A COLLECTION OF 51 MAC HAM PROGRAMS FOR AMATEUR RADIO
+MISC
1010CLUB 10-10 CLUB MEMBERSHIP DATABASE PROGRAM
AB5P GRAYLINE SUNRISE, SUNSET, AND GRAYLINE PROGRAM BY AB5P
ARRLART PCX CLIPART OF HAM RADIO RELATED SUBJECTS BY KB2ECI
BEAMER BEAMER V1.0 BEAM HEADING PROGRAM BY WK9T
CALLTIME NBSTIME SET PC TIME TO NATIONAL BUERAU OF STANDARDS
CLOCK CALLSIGN/CLOCK DISPLAY YOUR CALL AND TIME BY KC6QIS
COUNTRY A COLLECTION OF 248 DX COUNTRY MAPS IN PCX FORMAT
DK8JY JVFAX V5.0 FAX AND SSTV RECEIVE PROGRAM BY DK8JY
DXLOCATR THE DX LOCATOR BEAM HEADING PROGRAM BY KB2BK
ELMER ELMER V1.00 ARTIFICIAL INTELLEGENCE PROGRAM BY G3ZCZ
EZ_SSTV EZ SSTV v2b USABLE PASOKAN TV DEMO PROGRAM BY WB2OSZ
FFT128 FFT-128 FOURIER WAVE ANALYSIS PROGRAM
FFTDSP FFTDSP V3.00 DIGITAL SIGNAL PROCESSING PROGRAM BY AF9Y
FILTER20 ACTIVE FILTER DESIGN TOOLS V2.01A
GATE_SIM A LOGIC GATE LEVEL SIMULATOR V1.0
GEOCLOCK GEOCLOCK V6.0 SHOWS GRAYLINE WITH TWILIGHT AREA

GRID_SQR GS V1.1 MAIDENHEAD GRID SQUARE CALCULATOR PROGRAM
HAMCLOCK HAM-CLOCK V1.0 MULTIPLE TIME ZONE WALLMAP DISPLAY
HAMFEST HAMFEST MAILING LIST TRACKS ATENDEES & VENDORS
HAM_GFX HAM GRAPHICS IN PRINTSHOP, PRINTMASTER, NEWSROOM +++
HAM_RAGS CROSS REFERENCE INDEX FOR OLD MAGAZINES BY K7NTV
HOMECTRL GAME PORT MONITOR V2.0 HOME ENVIROMENT CONTROL
KC7WW PCTOR V1.09 & TORBIOS V1.07 AMTOR WITHOUT A TNC
MAKE_QSL QSL REPORT LABEL MAKER V1.1 PROGRAM BY KC4AZL
N4FLZ QRB/ATE V1.01 BEAM HEADING & DISTANCE PROGRAM
N4TL SUN CALCULATES SUNRISE & SUNSET TIMES BY N4KTL
N5OWK GREAT CIRCLE BEARING & RANCE CALCULATOR BY N5OWK
NMATGRAM NAVY MARSGRAM AUTO ENTRY OF NMAT 1 & 8 MARSGRAMS
O_SCOPE TEST BENCH EQUIPMENT SIMULATION - NICE DEMONSTRATION
PAMS_20 PAMS/AMCS AMTOR MSG CENTER SYSTEM (MARS) BY W5SSM
PC_CABLE COMPUTER CABLE INFORMATION ON WIRING YOUR PC CABLES
PHONETIC FIND THE PHONETIC FOR ANY LETTER OF THE ALPHABET
PSQSL PSQSL V2.00 QSL LABEL SORTER & MAKER BY W9XT
QQSL_54 QQSL V5.4 QUICK QSL LABEL MAKING PROGRAM BY AA4M/6
QSLCARDS QSLCARDS QSL LABEL MAKING PROGRAM BY N7LBP
RESISTOR RESIST V1.5 MOUSE RUN RESISTOR COLOR CODE IMPEDENCE
ROOSTERS DATABASE OF THE ROOSTER NET 3.990 MHZ 6AM EST DAILY
SB_SSTV VIEW SLOW SCAN TELEVISION USING THE SOUND BLASTER
SHUTTLE TRACKER FOR EGA/VGA TRACKING OF SPACE SHUTTLES
SMTHCHRT SCAT V2.0 SCATTERING PARAMETERS USING SMITH CHART
SOLAR SOLAR PANEL TUNE UP & OPTIMIZATION PROGRAM BY WD9AHF
SSTV2 RDSSTV V2.0 SLOW SCAN TELEVISION READER BY WA5VLZ
SUNTIME ANYTIME/SUNTIME V1.2 SHOW TIME UP TO 11 WORLD CITIES
TERRATIM TERRATIME V2.1 DISPLAYS LOCAL TIME UP TO 44 CITIES
VE2IQ AUDIO SPECTRUM ANALYZER SYSTEM USING FFT BY VE2IQ
VE6AAP SARA PORT TO PORT TRANSFER PROGRAM BY VE6AAP
VK5BUB GCP A GREAT CIRCLE PROGRAM BY VK5BUB
WA9WJN HAMRAD-DSK1 SEVERAL HAM PROGRAMS BY WA9JWN
WB5VKX HAMTOOLS BEAM HEADING & DISTANCE PROGRAM BY WB5VXK
WORLD29 THE WORLD V2.9 LOOK AT THE WORLD FROM SPACE ZOOM IN
WORLDTIM WORLD TIME DISPLAYS TIME FOR UP TO 30 WORLD CITIES
ZCZBASIC LEARN BASIC PROGRAMMING LANGUAGE TUTORIAL BY G3ZCZ
+MODS OVER 1,350 RADIO MODIFICATIONS BY MODEL & MANUFACTURER
+MUF
MUF_01 HF_SYNCHRONIZER DETERMINES BEST TIME TO MAKE A HF QSO
MUF_02 PROPPLUS MUF LUF CALCULATOR FROM RADIO NETHERLANDS
MUF_03 BANDAID MUF PREDICTIONS, BEACONS, PREFIXES AND MORE MUF_04 WORLDFIX V5.5 DXCC
BEARING & DISTANCE PROGRAM BY NF4A
MUF_05 MAPPER EGA/VGA V3.0 VISUAL F2 LAYER PROPOGATION
MUF_06 MINIMUF V4.1 PLOTS MUF FROM YOUR QTH BY N6BV
MUF_07 DXHELP CALCULATES THE MUF FROM YOUR QTH BY WA5ZBC
MUF_08 DX-ONLINE SHOWS MUF FROM YOUR QTH BY KD5OL
+MULTMODE
AEA_01 ARoREN PK232/KENWOOD 440 DUAL CONTROL BY K5WNV
AEA_02 ACUTERM V0.410 PK232/KENWOOD 440/940 CONTROL BY N8BA
AEA_03 REALTIME FAX FOR PK232 BY WB3DBU

ALL_01 RTP V1.0 RADIO TERMINAL PROGRAM BY N4PY
ALL_02 LAN-LINK V2.32 FROM JOE KASSER, G3ZCZ, 5 STAR PROGRAM
KAM_01 PERSONAL MAIL-BOX TERMINAL EMULATOR BY N3DFD
KAM_02 KAM V4.0 HAMLOG AND CALLIST PROGRAMS USE DBASE III
MFJ_01 DFAX V1.24 MFJ-1278 FAX VIEW TEST PROGRAM
+PACKET
APLINK APLINK V6.04 AMTOR\PACKET PROGRAM BY W5SMM
DIGIS A COMPLETE LISTING OF DIGIPEATERS ALL OVER THE WORLD
DOCS READABLE FILES THAT TEACH YOU ABOUT PACKET
INTRFLEX COLLECTION OF PK_GOLD & KA_GOLD PROGRAMS
KA9Q_01 KA9Q INTERNET PROTOCOL PACKAGE V871225.31
KA9Q_02 SHORTNOS BY PA0GRI V2.0D (KA9Q V911229)
KA9Q_03 SOURCE CODE FOR KA9Q V131 SOFTWARE
KA9Q_04 LARGENET BY PE1CHL V900415 (KA9Q V871225.33)
KA9Q_05 WNOS BY DB3FL V2B DERIVATIVE OF KA9Q INTERNET
KA9Q_06 GRINOS 910702v0.4B BY N1BEE (KA9Q 910618)
KA9Q_07 KA9Q INTERNET PROTOCOL PACKAGE V910131 NOS
KA9Q_08 KA9Q INTERNET PROTOCOL PACKAGE V900214 NOS
KA9Q_09 JNOS V1.08C TCP/IP BY WG7J (KA9Q V911229)
KA9Q_10 GRINOS 910921v0.72s BY N1BEE (KA9Q V910618)
KA9Q_11 NET/ROM BY W9NK (KA9Q V890421.0 ds = 2dc9)
LAN_LINK LAN-LINK 2.32 MULTIMODE PACKET W/PACTOR BY G3ZCZ
MSYS_1 MSYST V1.00 YAPP PROTOCOL SYSTEM BY WA8BXN
MSYS_2 MSYS FBB MAIL CONVERSION UTILITY
MSYS_3 MSYS V1.12 PACKET RADIO BBS BY WA8BXN
PAK_01 STATS MONITORING PACKAGE V1.1 BY WB6YMH/NK6K
PAK_02 PACKET PICPRO WEFAX & PICTURE XFERS BY K4ABT & KF4JF
PAK_03 ROSE X.25 INTERACTIVE PACKET NETWORK BY W2VY
PAK_04 PTP V4.00 PACKET TERMINAL COMMUNICATOR BY N4PY
PAK_05 PAKET V5 THE AUSSIE'S BEST PACKET PROGRAMY BY VK2DHU
PAK_06 BAYCOM NO-TNC TERMINAL PROGRAM V1.50A BY DL8MBT/DG3RBU
PAK_07 WPL V1.02 WAVELET PACKET LABORATORY DIGITAL DIAGNOTICS
PAK_08 EZ PACKET V1.40 PACKET TERMINAL PROGRAM BY AA4L
PAK_09 HAMCOM PACKET TERMINAL PROGRAM BY AE6G
PAK_10 PACKCOM V0.75 PACKET TERMINAL PROGRAM BY WB4ZJV
PAK_11 ARES\DATA V1.5 EMERGENCY RESPONSE DBASE BY WN6I & N6KL
PAK_12 BSQ V2.0 TRANSFERS ARBITRARY BINARY FILES BY W1GOH
PAK_13 CHYNK 'N GLUE V1.5 PACKET FILE TRANSFER BY WD4OQC
PAK_31 GRAPHIC PACKET V1.00 PACKET TERMINAL PROGRAM BY DH1DAE
PAK_15 ESTIMATE NETWORK THROUGHPUT ON PACKET RADIO BY KZ1O
PAK_16 PACKWIN V1.2 PACKET TERMINAL PROGRAM BY N2CJ
PAK_17 THE CRYNWR COLLECTION OF PACKET DRIVERS
PAK_18 HOSTTERM V3.10 PACKET TERMINAL PROGRAM BY WK2S
PAK_19 R95 BY WD5IVD, PATHCALC NW6H, SETPLUS BY NJ7P
PAK_20 PCT HOSTMODE PACKET TERMINAL PROGRAM BY DD6CV
PAK_21 APRS V4.03 PACKET LOCATION FINDING PROGRAM
PAK_22 DXALERT V2.3 DX PACKET CLUSTER PROGRAM BY KA6JLT
PAK_23 RENAME UTILITIES FOR DX PACKET CLUSTER SYSTEMS
PAK_24 THS V2.50 TNC HOSTMODE SERVER PROGRAM BY HB9CVV
PAK_25 TNCKAM TNCMFJ SETS TIME ON THE KANTRONICS & MFJ TNC'S

PAK_26 FLEXPAC DX CLUSTER PACKET TERMINAL PROGRAM BY ND2O
PAK_27 PHS V3.00 PK-232 HOSTMODE SERVER PROGRAM BY HB9CVV
PAK_28 NTS ALLOWS YOU TO PASS NTS TRAFFIC ON PACKET BY VE4UB
PAK_29 PACFAST HIGH SPEED PACKET TERMINAL PROGRAM BY N5ARU
PAK_30 TPK V1.81 PACKET TERMINAL PROGRAM BY F1EBN
AA4RE_01 AA4RE PACKET BBS V2.11 PBBS PROGRAM BY AA4RE
AA4RE_02 AA4RE TOOLS AND UTILITIES FOR THE AA4RE PBBS
AA4RE_03 RC-85 REPEATER CONTROLLER PROGRAM BY AA4RE
BACKTALK BACKTALK V11.1.1 FORWARDING PBBS & TERMINAL BY N3DFD
CBBS CBBS V6.45 SUPERFAST PBBS WRITTEN IN C BY K3RLI
FBBS FBBS V5.12 10 LANGUAGES AVAILABLE IN THIS FRENCH PBBS
BPQ_01 THE G8BPQ AX25 V4.06E NETWORKING SOFTWARE PACKAGE
BPQ_02 MONITOR HEARD LIST V1.02 FOR BPQ NODES BY G4YFE
PACKTALK PACKTALK PBBS PACKET SOFTWARE PROGRAM BY N3DFD
ROSERVER ROSERVER V1.45 PACKET RADIO MAILBOX SYSTEM BY KA2BQE
W0RLI_01 W0RLI PC MAILBOX PBBS PACKET SOFTWARE BY W0RLI
W0RLI_02 W0RLI TOOLS USEFULL UTILITIES FOR THE WORLI PBBS
W0RLI_03 RLIMAIL V2.10 MAIL UTILITY FOR W0RLI BY WB2COY
MBL_01 LOG PROCESSOR FOR WA7MBL PBBS BY G3ZCZ & N4QQ
MBL_02 BIS V2.0 BBS INTERFACE FOR USE WITH WA7MBL PBBS
YAPP YAPP PROTOCOL FOR ADVANCED NETWORK COMMUNICATIONS
+RTTY
RTTY_01 RTP V1.2E RADIO TELETYPE PROGRAM BY KF4NB
RTTY_02 MSO232 V1.B RADIO TELETYPE PROGRAM BY N2IZB
RTTY_03 TTY V3.7 RADIO TELETYPE PROGRAM BY AA4L
RTTY_04 K2TATERM RADIO TELETYPE PROGRAM BY K2TA
RTTY_05 RTTY 2000 RADIO TELETYPE PROGRAM BY W0SE
RTTY_06 TTY READER V1.2B A RTTY/ASCII VIEWER
RTTY_07 RTTY RADIO TELETYPE PROGRAM BY W1HZH
RTTY_08 DL5YEC HAMCOMM V2.2 READ RTTY W/O CONVERTER
RTTY_09 COPYCAT V1.0 RTTY DECODER DEMO BY N5JMZ
RTTY_10 HOKA CODE3 RTTY DECODER DEMO BY N5JMZ
+SAT
SAT_01 STSORBIT PLUS V9415 SPACE SHUTTLE & SATELLITE TRACKER
SAT_02 PC-TRACK V2.14ATELLITE TRACKING PROGRAM
SAT_03 WHATS-UP V1.30 SATELLITE TRACKING PROGRAM BY G3ZCZ
SAT_04 TRAKSAT V3.00 SATELLITE TRACKING PROGRAM
SAT_05 SATEQ V7.4 SATELLITE TRACKING PROGRAM BY OE1HSI
SAT_06 ELEMENT MANAGER V1.8 SATELLITE ELEMENT MAINTENANCE
SAT_07 QUIKBBS SATELLITE SCHEDULE MANAGER FOR BBS OPERATORS
SAT_08 QUICK-KEP KEPLERIAN ELEMENTS TRANSLATION BY WB2MNF
SAT_09 TLM1 DECODES MICROSAT TELEMETRY FROM NON-KISS FILES
SAT_10 RS10/RS11 TELEMETRY BEACON CODE ANALYSIS PROGRAM
SAT_11 SEESATS SATELLITE TRACKING PROGRAM BY NM1D
SAT_12 SMART TRACK V0.92B SATELLITE TRACKING PROGRAM BY W6PIO
SAT_13 VECTOR TO 2 LINE ELEMENTS V9421 PROGRAM BY N2WWD
+SPACE THE LATEST SPACE IMAGES & SPACE NEWSLETTERS
+SVGA SVGA v1.12 SUPER VGA VIEWING UTILITY AUTO DETECTS CARDS
+SWL
DOCS DOCUMENTATION FILES WITH OVER 50,000 SWL LISTINGS

SWL_01 SCANPRO MONITORING DATABASE FOR 400 CHANNEL SCANNERS
SWL_02 SHORT V1.4 SHORTWAVE FREQUENCY DATABASE PROGRAM
SWL_03 THE RAC FREQUENCY CATALOG V1.1 & US GOVERNMENT DBASE
SWL_04 SCANNER FREQUENCY FINDER WITH NICE DC AREA DATABASE
SWL_05 SCANNER BUFF PRO V3.76 WITH LOS ANGELEA AREA DATABASE
SWL_06 SCANNER MANAGER V5.0 SCANNER DATABASE PROGRAM
SWL_07 CHART, ASCII FREQUENCY LIST CREATER & PRINTER UTILITY
SWL_08 FREQUENCY MINDER V1.0 SCANNER PROGRAM W/CA DATABASE
SWL_09 SCANNER FREQUENCY DATABASE MANAGEMENT SYSTEM V1.0
SWL_10 SCANNER FREQUENCIES V1.0 SCANNER DATABASE PROGRAM
SWL_11 SHORTWAVE LISTENING GUIDE V2.91 WORLDIDE SHORTWAVE
SWL_12 PC SHORTWAVE MONITOR V2.01 THE LOGGING ORGANIZER
SWL_13 SWRADIO, READ HOW TO BUILD A SWL RCVR BY MENDEL COOPER
SWL_14 TUNE-IN, SCANNER DATABASE PROGRAM W/TEXAS FREQUENCIES
SWL_15 SCANNER ALLOCATION PROGRAM (REQ. FOXBASE+ SOFTWARE)
SWL_16 SCANNER DATABASE V1.0 PROGRAM WITH CANADIAN FREQS
SWL_17 TFD v1.0 - THE FREQUENCY DATABASE BY VE3HAM/VE3UCM
+WEATHER
WEA_01 STORM V6.1 HURRICANE TRACKING PROGRAM WITH PAST TRACKS
WEA_02 WXRDR V3.0 PRODUCE IMAGES BY DOWNLOADING RADAR INFO
WEA_03 TIDES V2.00 FORCASTS TIDAL INFORMATION ANYWHERE
WEA_04 RADARSCAN V1.1 MAKES HIGH RES PLOTTED WEATHER MAPS
+WINDOWS
BMP_GFX1 Part1; AMATEUR RADIO IMAGES FOR WINDOWS PROGRAMS OR
BMP_GFX2 Part2; USE AS WALL PAPER, OR IN PUBLISHING PROGRAMS
WIN_01 WAS MAP V2.1A DISPLAY & TRACK WAS AWARD BY KC4B
WIN_02 KENTROL CAT CONTROL FOR KENWOOD RADIOS BY VE3BGB
WIN_03 PACKY V1.03 PK88/PK232 PACKET SOFTWARE BY N7SNQ
WIN_04 OHMS-LAW V1.3 CALCULATE CAPACITOR & RESISTOR CIRCUITS
WIN_05 RF POWER DENSITY 2 MEGAHERTZ TO 10 MEGAHERTZ CALC
WIN_06 SCANBASE V2.1 SCANNER DATABASE WITH SAN FRANCISCO AREA
WIN_07 WINLOG VERSION 1.1 LOGGING PROGRAM BY DL1DAE
WIN_08 WORLDTIME V2.1 DISPLAYS THE TIME IN 6 WORLD LOCATIONS
WIN_09 WINTZ DISPLAY TIME IN 24 WORLD TIMEZONES ON 1 SCREEN
WIN_10 RUSSIAN LANGUAGE TUTOR REQUIRES SOUNDBLASTER CARD
WIN_11 160m-10cm v2.0 BANDPLAN DISPLAY PROGRAM BY KA2KQP
WIN_12 GMT CLOCK DISPLAY IN SMALL WINDOW BY KA2KQP
WIN_13 TECH EXAM DEMO BY PRACTICA-LY REQUIRES VBRUN200.DLL
WIN_14 GENERAL EXAM DEMO BY PRACTICA-LY REQUIRES VBRUN200.DLL
WIN_15 ADVANCD EXAM DEMO BY PRACTICA-LY REQUIRES VBRUN200.DLL
WIN_16 EXTRA EXAM DEMO BY PRACTICA-LY REQUIRES VBRUN200.DLL
WIN_17 FREQUENCY MANAGER DATABASE BY BEN SALADINO
WIN_18 DIPOLE DESIGNER PROGRAM BY N4PVU
WIN_19 10 MINUTE ID TIMER V1.12 BY KK7A
WIN_20 NUMORSE V0.9 MORSE CODE TRAINER BY G4AUD
WIN_21 WRITELOG DEMO LOGGING PROGRAM BY W5XD
WIN_22 R-7000 CONTROLLER DATABASE BY BEN SALADINO
WIN_23 WINPACK V1.0 PACKET SOFTWARE BY KI7CU
WIN_24 PKTWIN V1.1 PACKET SOFTWARE BY G4YFE
WIN_25 PACKETPET LITE FOR WINDOWS PACKET SOFTWARE

WIN_26 747-CAT v1.12 CAT CONTROL PROGRAM BY WB6IZG
WIN_27 R7000 v1.12 CAT CONTROL PROGRAM BY WB6IZG
WIN_28 ID LOGIC SIMULATOR FOR WINDOWS BY PRS CORP.
WIN_29 SHORTWAVE SIMULATOR FOR WINDOWS BY PRS CORP.
WIN_30 WORLD TIME CLOCK FOR WINDOWS BY PRS CORP.
WIN_31 ORBIT TRACK v1.0a FOR WINDOWS BY KE9PU SOFTWARE
WIN_32 PRO-CAT CAT CONTROL FOR WINDOWS BY WB8YQJ

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Internet: amsoft@epix.net

2175. Re: Keps for KO-25

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 21:50:43 UTC
From: n7ryw@teleport.com
Message-ID: <3da7t7$kst@desiree.teleport.com>
Source record: 26277

In article <seeler.161.788015973@UPEI.CA>, seeler@UPEI.CA said...
>
>Hi - With the recent decision to drop the old KO-25 assignment - I have
a
>question as to the recent W1AW posting where it has KO-25 and KO-25?

Will the REAL KO-25 Please Stand Up?
Look for object number 22828 in the listings. In two line elements, this
is just below the satellite name. Each line has a line number, and then
the object number. Space Command got 22830 and 22828 mixed up, and they
have not un-mixed them. I doubt they ever will, unless they commit the
same error again and it happens to straighten things out.
--
From Bill, n7ryw@teleport.com

2176. Re: HTTP Satellite Info?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 22:33:54 UTC
From: bob kline <bkline@space.honeywell.com>
Message-ID: <1994Dec21.153355.1594@biivax.dp.beckman.com>
Source record: 26278

n7ryw@teleport.com (William Roth) wrote:
>
> In article <3co5ka$p29@crl9.crl.com>, arthurc@crl.com said...
> >
> > Could someone post or email me any helpful and/or spiffy http pages
> >with Ham/satellite info? I'm brand new to the satellite world, so
> >anything and everything = appreciated.
>
> http://www.teleport.com/~n7ryw/asatpage.html
>
> Amsat also has a page, but I forget the URL. There is a link to it in
> mine, though.
>
> Have fun!
>
> From Bill, n7ryw@teleport.com
>
The AMSAT site is as follows:

http://www.amsat.org/amsat/AmsatHome.html

Good Luck

n7skt

2177. Amsoft 1/95 CD-ROM Press Release 2

Newsgroup: rec.radio.amateur.space
Date: 1994-12-21 23:44:15 UTC
From: amsoft@epix.net
Message-ID: <3daekf$5tv@grape.epix.net>
Source record: 26279
Cross-posted to: rec.radio.scanner,rec.radio.shortwave,rec.radio.amateur.space,rec.radio.swap

The Jan 95 AmSoft CD-ROM will be shipping December 23, 1994.
Cost is $39 plus shipping $3 USA, $5 Foreign. Over 20,000
files for amateur radio. Plus the CALLSIGN call book, and
AMCALL the new logbook from AmSoft that will auto log from
the CD for you. Over 1,350 Radio Mods. The latest HST images.
Over 700 Megabytes of Amateur Radio Software packed into 1 CD.

Version 4.0 Callsign will search for US & Foreign amateurs by
CALL or partial CALL
LAST NAME, FIRST NAME, or partial NAME
STATE, CITY or partial CITY
ZIP CODE or partial ZIP CODE
Create Avery label mailing lists
Create QSL address labels
When used with AmCall Logbook, will create your QSl contact information labels.

Help locate lost & missing children too. The complete list of
1,100 .gif images from the Heidi Search Center is constantly
maintained with up to the minute changes shown on the WWW at
http://www.halcyon.com./alt.missing-kids.gifs

This CD is published every 4 months without delay every JANUARY, MAY, & SEPTEMBER.

If you would like to know what others think about the AmSoft CD-ROM then read what
the authors of Amatuer Radio & Electronics magazines are writing:

Popular Electronics January 1995 pages 8, & 92
Nuts & Volts November 94 pages 21, 22, & 23
CQ November 1994 page 97
World Radio September 1994 (Hams at Seaside article)
Communication Quarterly Fall 1994 pages 41-52 & 95-98
Monitoring Times August 1994 page 91
The Amateur Communicator May/June 1994 page 23
73 Amateur Radio Today March 94 page 88
Monitoring Times March 1994 page 96
World Radio February 1994 page 70
CQ December 1993 (Karl Thurber article)
QST December 1993 page 90
Monitoring Times August 1993 pages 98, & 99
Popular Electronics July 1993 pages 53, 60, & 96
CQ March 1993 page 77

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Or Email us your order at amsoft@epix.net

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please leave me your mail or E-mail information or internet id at: amsoft@epix.net
---
Reply to: Pete KC3TL at (amsoft@epix.net) or call 717-938-8249

2178. Re: APT-Satellites: Report DEC 17, 1994

Newsgroup: rec.radio.amateur.space
Date: 1994-12-22 00:02:53 UTC
From: jack.sippel@nellcor.com
Message-ID: <3dafnd$31v@rodan.nellcor.com>
Source record: 26280

In article <peter.henne-191294092110@oskar.gmd.de>, peter.henne@gmd.de
(Peter Henne) says:
>

>APT of OKEAN 1-7 was off during all available
>passes. NOAA-11 imaging is dead, burst and timing
>signals are active. Meteor 2-21 is the only active
>russian APT-bird, signal is weak (antenna-boom not
>deployed?). NOAA-10 is in standby-mode, no APT. No
>other APT-signal 136.00-137.99 MHz 07:30-20:00 UT.
>Lauch of NOAA-J is delayed until DEC 28.
>
Thank you Peter for providing this information. I am just learning to
decode APT imagery, and I was wondering why some satellites were not on
the air when my tracker predicted them. I was also wondering if I was
doing something that made NOAA-11 look like a snowstorm.....now I know it
is them, not me!

Please continue to post your observations. :)

2179. Geos-Tap Question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-22 06:58:53 UTC
From: DVRobson@ix.netcom.com
Message-ID: <3db83d$mbi@ixnews2.ix.netcom.com>
Source record: 26282

I understand how APT images are generated and sent from NOAA LEO satellites and WEFAX is sent from GEOS geostationary satellites but recently I have heard of GEOS TAP. Is it a WEFAX image on C Band TV satellites? What kind of receiver is required to receive GEOS TAP images? I'm interested to see if I can add something to my C band/Ku band system and get WEFAX. Is that a feasible proposition. Any information would be appreciated.

David Robson

2180. Re: Minimum $$$ for satellite work?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-22 14:00:52 UTC
From: stephens@gdim.geod.emr.ca
Message-ID: <1994Dec22.140052.4144@emr1.emr.ca>
Source record: 26284

Arthur Chandler (arthurc@crl.com) wrote:
: Greetings! Hope folks here can help me/us out:
: My son has an Icom 2mm/70cm handheld, a packet modem and a Macintosh
^^
: computer with an Internet connection.
: What, in your view, is the minumum equipment he will need to purchase
: and/or download to have a satisfying experience with satellite tracking --
: voice and/or packet?
: Email or post = much appreciated!
: 73
Wow! A 150 GHz HT. I wanna one for Xmas.
Seriously. I f he only wants to listen, I suggest he listens for
the Dove signals, they are packet and loud. There are Mac
tracking programmes on oak.oakland.edu. Sorry I can not recommend
one I am a PC user (Boo Hiss!). The two line elements are available
on archive.afit.af.mil pub/space. Voice: unfortunately AO21 seems to
have died, that could be received on a modest FM receiver and an
outside antenna on 2 m.
A good preamp and antenna and he might hear signals from FO-20
The digital signals are not FM but PSK, but arre in AX-25.

Sorry I can not suggest a two way system without buying a multimode
two meter rig and a 28 mhz receiver and using RS-10.
73 VE3PYG

--
Dave Stephenson
Geological Survey of Canada *Too much bad arithmetic is not a *
Ottawa, Ontario, Canada *substitute for not enough good *
Internet: stephens@geod.emr.ca * mathematics *

2181. Radio Astronomy info

Newsgroup: rec.radio.amateur.space
Date: 1994-12-22 20:27:45 UTC
From: andrew@paddocks.demon.co.uk
Message-ID: <D18BIA.G0x@demon.co.uk>
Source record: 26285

I'm thinking about dabbling into astronomy. Anyone out there actually doing this ? I would be interested in finding out a little bit about the actuals signals I would need to look for and roughly and whats needed to process them into something meaningful ??

+------------------------------+--+
| Andrew Gawthrope G0RVM | internet : andrew@paddocks.demon.co.uk |
| | |
+------------------------------+--+

2182. Raw APT Data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-22 22:00:33 UTC
From: dale@dsq950.com
Message-ID: <dale.1138521273A@news.ip.portal.com>
Source record: 26286

I am developing an application for Macintoshes to decode APT data from the 2.4Khz AM tones. However, I am having trouble receiving any sats. So in the mean time, does anyone have a cassette of a recorded pass that I could have/copy/buy?

2183. Re: Microsats via Internet???

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 01:46:28 UTC
From: hansen@jane.cs.fredonia.edu
Message-ID: <1994Dec23.014628.1184@penny.cs.fredonia.edu>
Source record: 26289

Gerald Ward (exuward@exu.ericsson.se) wrote:
: Hi Ron,

: Do you know where I can get a procedure on how to do this? I don't
: think my dad knows how to locate a gateway. At sea, he's not in the normal
: packet radio range so I don't know if there is anything in the "area".
: He has a station and usually gets on ko-23, ko-25, ao-13, ao-20, and
: some others.

: Thanks,

: Jerry.

The satellite gateway stations do not provide access to the Internet. They are simply an alternative means of packet mail forwarding (much like HF gateways do). In fact, it is likely that non-amateur traffic will get bounced. A gateway node comes a little closer to what you have in mind, since it provides access to the satellites to hams who do not have satellite stations themselves. I wrote the software for that service and used to run a node. I also allowed non-hams to access it via phone, though not via Internet. However, non-hams could only read, not write messages, because third party traffic is illegal with many if not most of the nations that are on the microsats. At this point I know of no service that does what you would like. One possibility would be to get an amateur license yourself. It is not a very difficult matter these days.

Good luck es 73, John WA0PTV (@amsat.org)

2184. Re: Radio Astronomy info

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 06:45:20 UTC
From: brax@ava.hut.fi
Message-ID: <brax.5.2EFA7200@ava.hut.fi>
Source record: 26290

In article <D18BIA.G0x@demon.co.uk> andrew@paddocks.demon.co.uk writes:

>actuals signals I would need to look for and roughly and whats needed to
>process them into something meaningful ??

Radio (g)astronomy means that you receive the RF signals generated in distant objects of the sky, like the Sun, other stars, galaxies, black holes and so on. These objects emit radiation at a whole spectrum of frequencies, RF being only one band of it. Radio astronomy is many times very similar to optical astronomy in the sense that you produce an intensity-coded "picture" of the object, or monitor the intensity of an (apparently) point source. Only the information is carried by waves that have much longer wavelength than visible light or UV.

The close analogy to optical astronomy means that where a telescope is needed in optical observations, a *very* highly focusing antenna is required to receive the radio signal. After all, your sources are rather small (even if you concentrate on the Sun) and you don't want to look at all the other sources simultaneously that cover the 2*pi steradians in your field-of-view. In practical radio astronomy, this has lead to the use of large parabolic disc antennae and even large-scale arrays of these huge dinner-plates.

I don't mean to discourage you, but unless you have access to very exceptional antenna facilities, your radio astronomy hobby might become a very short-lasting one.

Matti Brax
Helsinki University of Technology
Lab. of Space Technology

2185. Hubble Space Telescope

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 09:55:48 UTC
From: mdhavener@ccgate.dp.beckman.com
Message-ID: <mdhavener.33.0009EE66@ccgate.dp.beckman.com>
Source record: 26288

Hello:

Name here is Mike, and I'm wondering if anybody out there has information on the Hubble Space Telescope (operating freqs., modes, etc.). Judging from the orbital track, it looks like it should be easy to listen to anyway.

If you have any info, please send it to:

internet email: mdhavener@ccgate.dp.beckman.com

America Online: GLIDE4FUN

Packet: KE6FJT @ KJ6VC.#SOCA.CA.USA.NA

Thanks in advance for your help.

73's de Mike Havener / KE6FJT

2186. Sat inclinations

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 14:41:18 UTC
From: dave@lynx.mn.org
Message-ID: <JZJsXc2w165w@lynx.mn.org>
Source record: 26291

What inclinations do the OSCAR satillites have? I live in Minnesota
so if they aren't at 45 degrees or better then any other investigation
I would do into contacting them would be moot.

Also, do you need an antenna capable of tracking the satillite in
order to talk to them? Or would a cheaper omni-directional one
do the job?

Thanks.

93.2% of all statisitics are simply | David Messer (dave@lynx.mn.org)
made up on the spot. | Lynx Data Systems

2187. Transponder freqs, where to get them!?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 17:20:46 UTC
From: cap2624@ultb.isc.rit.edu
Message-ID: <1994Dec23.172046.23529@ultb.isc.rit.edu>
Source record: 26287

Still, no one has answered my question as to where to obtain the
transponder frequencies and modes of opertaions for the various
satellites? The Keps tell everything but this!

--
+---+
| Rochester Institute of Technology Christopher A. Peskin |
| Electrical Engineering |
+---+

2188. Re: Minimum $$$ for satellite work?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 21:29:33 UTC
From: brgrant@aloha.com
Message-ID: <brgrant.12.02CBE27C@aloha.com>
Source record: 26294

In article <3d7v0c$b5t@crl.crl.com> arthurc@crl.com (Arthur Chandler) writes:
>From: arthurc@crl.com (Arthur Chandler)
>Subject: Minimum $$$ for satellite work?
>Date: 20 Dec 1994 17:05:16 -0800

> Greetings! Hope folks here can help me/us out:
> My son has an Icom 2mm/70cm handheld, a packet modem and a Macintosh
>computer with an Internet connection.
> What, in your view, is the minumum equipment he will need to purchase
>and/or download to have a satisfying experience with satellite tracking --
>voice and/or packet?
> Email or post = much appreciated!
> 73
Please post as I too would like to know.

Brian

Brian Grant 1D FB 7B E0 B8 D3 2B 51 E1 89 41 A1 C2 5D D2 64 \|/ ____ \|/
email: brgrant@aloha.com Key on server @~/ ,. \~@
ICBM : 21deg 23min 30.1sec N, 157deg 56min 29.8sec W /_(_ /)_\
PADI MSDT #65640 SSI AOWI #5048 CMAS #18044 NZFPC #C799 __U_/

2189. Re: Raw APT Data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-23 22:23:02 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3dfik6$sj2@cello.gina.calstate.edu>
Source record: 26120

Hi Dale,

I am interested in your APT decoding project. My APT scanner is at school and I will not be able to get to it until after Jan 3. If you still need a tape od a wx sat pass at that time, I'll send you one. What kind of receiving equipment are you using? What tracking program? If you are on the correct frequency at the right time you should be hearing sats. (Sorry if you know all this already :-)

Look elsewhere in this newsgroup to see which satellites are active from week to week. Peter Henne (sp?) posts this info regularly.

Good luck!

Bob Houghton

2190. Re: Shuttle Listening Confirmations?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-24 02:58:43 UTC
From: winter@apple.com
Message-ID: <3dg2p3$cib@apple.com>
Source record: 26293

In article <3cuplo$6jp@vixen.cso.uiuc.edu>,
Bradley T. Banko <btbanko@prairienet.org> wrote:
>During the September mission, I copied direct voice and packet from the
>shuttle. I sent in listening reports to the ARRL (who was supposed to be
>handling the SWL & QSLs), and I still haven't gotten my confirmation.

The ARRL doesn't actually handle the QSLing themselves. They just
act as a central mailing address. Individual amateur radio clubs
volunteer to handle the QSLing for each mission.

>Am I wrong in thinking that an SWL rates a confirmation?

Not at all! SAREX SWL reports are confirmed just as two-way QSOs are.

>How long might it be before these confirmations come out?

I haven't heard any rumors about this particular mission. Past
experience has shown that it takes anywhere from a few months
to a year, depending on how soon the crew selects a design for
the QSL card and how quickly the club can round up volunteers
to fill out the cards and stuff envelopes.

73,
Patty
(who is waiting *very* eagerly for her card from this mission
[STS-64] because it was my first voice contact with the shuttle!)

--
============================== Patty Winter ==============================
Apple contractor Internet: winter@apple.com
Sunnyvale, California AMPRNet: 44.4.4.44
"Here I've been talking with the most intelligent people
in the world, and I never even noticed." --Columbo
================================== N6BIS ==================================

2191. Re: Sat inclinations

Newsgroup: rec.radio.amateur.space
Date: 1994-12-24 03:25:44 UTC
From: n7ryw@teleport.com
Message-ID: <3dg499$8od@desiree.teleport.com>
Source record: 26292

In article <JZJsXc2w165w@lynx.mn.org>, dave@lynx.mn.org said...
>
>What inclinations do the OSCAR satillites have? I live in Minnesota
>so if they aren't at 45 degrees or better then any other investigation
>I would do into contacting them would be moot.

Most are Polar, and available to everyone. Oscar 13 has a highly inclined orbit, but the actual Apogee is at about 6 degrees North. Despite this, it is quite possible for you to use it, as it is very high at apogee, over 40km. I am at 45 degrees Lat., and I get all the sats except the low (28 degree) Shuttle Missions. The high ones (64 degree) are very good.

>Also, do you need an antenna capable of tracking the satillite in
>order to talk to them? Or would a cheaper omni-directional one
>do the job?

Sometimes, people get by with omnis on a few sats, but FAR better results are gained from a directional setup with a G-5400 rotor set. From here, I would suggest you buy or borrow the Satellite Experimenters Handbook. It's got it all.
--
From Bill, n7ryw@teleport.com

2192. Re: Transponder freqs, where to get them!?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-24 15:53:36 UTC
From: rparsons@bga.com
Message-ID: <rparsons-2412940953360001@slip222.bga.com>
Source record: 26295

In article <1994Dec23.172046.23529@ultb.isc.rit.edu>,
cap2624@ultb.isc.rit.edu (C.A. Peskin) wrote:

> Still, no one has answered my question as to where to obtain the
> transponder frequencies and modes of opertaions for the various
> satellites? The Keps tell everything but this!
>
>
> --
> +---+
> | Rochester Institute of Technology Christopher A. Peskin |
> | Electrical Engineering |
> +---+

CURRENT AMATEUR SATELLITE FREQUENCIES

Satellite UPLINK DNLINK TYPE

AO-10(Oscar10) 435.03-435.18 LSB/CW 145.975-145.825 USB/CW Mode B Analog

AO-13(Oscar13) 435.423-435.573 LSB/CW 145.975-145.825 USB/CW Mode B analog

AO-13 435.602-435.606 USB/CW 2400.715-2400.749 USB/CW Mode S Analog

FO-20 145.9-146.0 LSB/CW 435.9-435.8 Mode J Analog

AO-27 145.85 FM 436.80 FM Part-Time Rptr

AO-21 435.016 FM 145.987 FM INACTIVE

RS-10 145.865-145.905 USB/CW 29.360-29.400 Mode A Analog

RS-12 21.21-21.25 USB/CW 29.41-29.4 Mode K Analog

AO-16(PACSAT) 145.90,.92,.94,.96 FM 437.0513 SSB 1200 Baud PSK

DO-17 145.825 FM 1200 Baud AFSK
and VOICE
WO-18 437.104 SSB 1200 Baud PSK
(img)
LO-19(LUSAT) 145.84,.86,.88,.90 FM 437.1258 SSB 1200 Baud PSK

FO-20(8J1JBS) 145.85,.87,.89,.91 FM 435.91 SSB 1200 Baud PSK

UO-22(UOSAT5) 145.9, .975 FM 435.12 FM 9600 Baud PSK

KO-23(HL01) 145.85, .90 FM 435.175 FM 9600 Baud PSK

KO-25(HL02) 145.98, .87 FM 436.5 FM 9600 Baud PSK

IO-26(ITMSAT) 145.875,.90,.925,.95 FM 435.822 SSB 1200 Baud PSK

POSAT(POSAT1) 145.975 FM 435.2777 FM 9600 Baud FSK

---

1) Frequencies shown are without Doppler compensation. For typical digital satellite pass the original signal will be about 8 kHz higher than what is shown.

2) WO-18 Webersat transmits experimental and image data and can be captured in KISS mode via PB or TLMDC.

3) Except for FO-20 the digital sats use a program suite containing PB/PG/PFHADD/PHS or WISP. The broadcast callsign (in PB.CFG) is the satellite's callsign with an SSID of -11. The connected mode callsign (in PG.CFG) is the satellite's callsign with an SSID of -12.

4) When in mode JD, FO-20 can be worked with any packet program. Connect to 8J1JBS. FO-20 currently alternates between modes JA and JD on a weekly basis. Check ANS bulletins for schedule.

5) AO-10 is no longer controllable but the transponder works when the satellite is in sunlight.

6) For AO-10 and AO-13, transmit LSB, receive USB. As transmitted frequency is increased the received frequency will decrease, (inverting transponder).

7) AO-21 currently operates on a 10 minute schedule with FM repeater, WEFAX image transmission, and 1200 baud AFSK telemetry in each cycle.

Source: The AMSAT Journal, Volume 17, No.3, May/June, 1994 issue, p17. Reprinted on packet with permission of AMSAT-NA, Silver Spring, MD, July 5, 1994.

2193. EME/Moonbounce

Newsgroup: rec.radio.amateur.space
Date: 1994-12-24 17:24:47 UTC
From: arthurc@crl.com
Message-ID: <3dhlgv$j1m@crl.crl.com>
Source record: 26296

Could someone here post or email me the internet sites or snailmail addresses of clubs, info sources, etc. having to to with earth-moon-earth amateur radio operations?
--... ...-- and thanks!

2194. ARLK056 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-24 19:22:40 UTC
From: w1aw@arrl.org
Message-ID: <$arlk056.1994@ampr.org>
Source record: 26297
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK056
ARLK056 Keplerian data

ZCZC SK24
QST de W1AW
Keplerian Bulletin 56 ARLK056
From ARRL Headquarters
Newington, CT December 24, 1994
To all radio amateurs

SB KEP ARL ARLK056
ARLK056 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-63
1 99963U 95999A 95033.30211252 .00136628 00000-0 40709-3 0 16
2 99963 51.6699 114.9867 0040902 359.8331 0.2628 15.95289378 24
AO-10
1 14129U 83058B 94355.02071613 .00000208 00000-0 10000-3 0 3311
2 14129 26.6699 292.0994 6023440 237.2524 50.5883 2.05880631 58663
RS-10/11
1 18129U 87054A 94355.59208903 .00000052 00000-0 40054-4 0 9991
2 18129 82.9229 190.3238 0010404 221.0134 139.0233 13.72346346375615
UO-11
1 14781U 84021B 94353.06139219 .00000214 00000-0 44094-4 0 7610
2 14781 97.7808 359.0933 0012900 41.0717 319.1456 14.69284924577452
RS-12/13
1 21089U 91007A 94353.70696307 .00000024 00000-0 99161-5 0 7624
2 21089 82.9265 233.8615 0028842 314.9694 44.9091 13.74051550194127
AO-13
1 19216U 88051B 94345.62747239 -.00000353 00000-0 10000-4 0 9993
2 19216 57.6449 215.4691 7249810 356.8485 0.5285 2.09724541 18232
UO-14
1 20437U 90005B 94355.76353525 .00000012 00000-0 21783-4 0 610
2 20437 98.5819 77.9066 0011491 4.7908 355.3382 14.29868482256393
AO-16
1 20439U 90005D 94355.25222937 .00000018 00000-0 24097-4 0 8590
2 20439 98.5919 78.8472 0011782 6.7687 353.3654 14.29922421256334
```

```
DO-17
1 20440U 90005E 94355.74800732 .00000022 00000-0 25424-4 0 8603
2 20440 98.5914 79.7252 0011897 4.4149 355.7131 14.30063117256428
WO-18
1 20441U 90005F 94355.23701124 -.00000007 00000-0 14220-4 0 8632
2 20441 98.5897 79.2065 0012403 6.4095 353.7252 14.30035400256350
LO-19
1 20442U 90005G 94356.25187999 .00000027 00000-0 27202-4 0 8594
2 20442 98.5936 80.5171 0012817 2.4470 357.6771 14.30135167256518
FO-20
1 20480U 90013C 94355.80050651 -.00000074 00000-0 -85186-4 0 7564
2 20480 99.0654 112.4282 0539914 274.7461 79.2217 12.83228196228193
AO-21
1 21087U 91006A 94354.09065055 .00000093 00000-0 82657-4 0 5494
2 21087 82.9407 5.1282 0034373 288.0955 71.6458 13.74549222195123
UO-22
1 21575U 91050B 94355.72677093 .00000047 00000-0 30372-4 0 5651
2 21575 98.4179 66.2589 0008586 87.8370 272.3794 14.36950404180016
KO-23
1 22077U 92052B 94355.15295726 -.00000037 00000-0 10000-3 0 4584
2 22077 66.0791 248.5220 0014174 243.5543 116.4008 12.86289854110831
KO-25?
1 22830U 93061H 94352.21787387 .00000034 00000-0 30960-4 0 3634
2 22830 98.5379 61.3599 0011912 0.7872 359.3325 14.28076989 63967
KO-25
1 22828U 93061F 94355.65010119 .00000031 00000-0 30161-4 0 3342
2 22828 98.6343 69.5066 0010767 12.0772 348.0671 14.28080603 32533
IO-26
1 22826U 93061D 94356.17335455 .00000023 00000-0 27246-4 0 3555
2 22826 98.6380 69.9981 0009992 24.4228 335.7428 14.27752290 64516
AO-27
1 22825U 93061C 94355.71557913 .00000011 00000-0 22095-4 0 3574
2 22825 98.6372 69.4771 0009246 25.6429 334.5196 14.27645843 64442
PO-28
1 22829U 93061G 94356.07935843 .00000060 00000-0 41752-4 0 3496
2 22829 98.6348 69.9527 0010784 11.4555 348.6886 14.28057002 64510
Mir
1 16609U 86017A 94355.90958194 .00003348 00000-0 49819-4 0 8728
2 16609 51.6491 326.4060 0002449 56.3294 303.7932 15.58313359505278

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
December 26, 1994, at 2330z on Baudot and AMTOR.
NNNN
/EX
```

2195. Re: APRS via satellite?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-25 07:26:49 UTC
From: tvr@cnmat.CNMAT.Berkeley.EDU
Message-ID: <TVR.94Dec24232650@cnmat.CNMAT.Berkeley.EDU>
Source record: 26298

The original APRS documentation suggests beaconing your APRS data
through Mir's TNC on 145.55 MHz. I've never seen anybody try this,
but it sounds like fun.

Don't do this automatically without taking proper precautions!

For nearly two years I have been trying to work the MIR on a voice pass,
I have worked it on packet about a zillion times, but really really
wanted a confirmed voice contact. Well, this morning at about 4:30am I
was writing a letter in another newsgroup when I heard the familiar sound
of packet bursts on 145.550, I reached over to my other computer and
booted up Instatrack, sure enough, there was the MIR.. A moment later
came the sound I had been waiting for, CQ CQ in a decidely Russian
accent! I scooted over to the mic and reponded with R0MIR this is
KB7VZL, how do you copy? KB7VZL I copy you very clear, what is
your name? My name is John, I'm located on the west coast of the
United States in Salem, Oregon. How are you this morning? I asked..
Hello John I am BLEEEEEEEEP BLEEEEEEEEEEEP BLEEEEEEEEEP!
...
Cosmonaut!! The packet continued for the entire pass and about
10 minutes after.. Several attempts to get the person on packet
to go voice failed.. I believe this was an un-attended packet
station which was acting on a script file, a very simple thing
to do and a very very RUDE thing to do!

...

If you're going to do this sort of thing, like beaconing through MIR,
make sure you take the right precautions. Like, make sure your machine
can copy MIR in AX.25 mode *before* your machine transmits, and that it
does not continue to retry for very long in the absence of data which
confirms continued packet operation. Perhaps APRS software does this
but i haven't gotten it up yet, and i'm quite skeptical. I am also
skeptical about using MIR (or STS) as a digipeater to begin with.

If you can't program your machine to do this kind of checking, then
stick to manual operation, and additionally, MONITOR your reception to
make sure no one changes modes. The offender, spoken of above, could
well be an inconsiderate manually operated station, who was not able or
willing to listen for voice. Please be careful.

-- KD6PAG

2196. Re: Radio Astronomy info

Newsgroup: rec.radio.amateur.space
Date: 1994-12-25 11:13:06 UTC
From: tsmithers@cix.compulink.co.uk
Message-ID: <D1D5tu.CI6@cix.compulink.co.uk>
Source record: 26299

Try The Society of Amateur Radio Astronomers (SARA).
The President is Chuck Foster (foster@macline.com) there is a home page at http://IRsociety.com/0c:/sara.htm|/ and a phone BBS on 0101 608 835 9605.

73 Trevor
tsmithers@cix.compulink.co.uk

2197. Re: Hubble Space Telescope

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 03:56:02 UTC
From: n9315@pnet16.navy.mil
Message-ID: <D1EG9F.69A@nctams1.uucp>
Source record: 26302

Although I don't remeber all the important info, HST uses the TDRS
system to relay its data to the Earth stations. If I remeber correctly,
this happens in the microwave range, at about 5 GHz.

```
*******************************************************************************
*Unless otherwise stated, expressed view are my own. They may not be the *
*opinions of my superiors, the U.S. Navy, the DoD, nor the U.S. government.*
* *
*Rich Sheff - KD6HWF\KH6 | krokus@m-net.arbornet.org (forwarded) *
*ex- VK6JCA, ex- HL9RMT | n9315@nctams1.navy.mil *
*******************************************************************************
```

2198. Re: Radio Astronomy info

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 05:48:24 UTC
From: jconsole@panix.com
Message-ID: <3dllf8$l57@news.panix.com>
Source record: 26300

> tsmithers@cix.compulink.co.uk ("T W Smithers") writes:
> Try The Society of Amateur Radio Astronomers (SARA).
> The President is Chuck Foster (foster@macline.com) there is a home page
> at http://IRsociety.com/0c:/sara.htm|/ and a phone BBS on 0101 608 835
> 9605.
>
> 73 Trevor
> tsmithers@cix.compulink.co.uk
>
>>>>

this ww server is alldata for repairs on cars !!!

2199. Re: AmSoft 1/95 CD-ROM Press Release 1

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 07:16:25 UTC
From: rcanders@nyx.cs.du.edu
Message-ID: <49d$kidpPPqN073yn@nyx.cs.du.edu>
Source record: 26301

Please learn to cross post. If you had I would have seen this only in one newsgroup. As it is I downloaded 4 copies of this post. I don't know if your CD-Rom is that good but because of your clueless posting I would not buy it anyway. I do have a CD-rom drive.

Rod Anderson N0NZO
--
Rod Anderson aka Mr. Nice Guy o o
rcanders@nyx.cs.du.edu _/\-__/* __/___
(*) o (*) * o
Lightning P-38 DeFelice

2200. Re: Sat inclinations

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 12:37:15 UTC
From: tedwards@Glue.umd.edu
Message-ID: <3dmddr$l6o@thrash.src.umd.edu>
Source record: 26303

In article <3dg499$8od@desiree.teleport.com>,
William Roth <n7ryw@teleport.com> wrote:
>In article <JZJsXc2w165w@lynx.mn.org>, dave@lynx.mn.org said...
>>What inclinations do the OSCAR satillites have?

>Most are Polar, and available to everyone. Oscar 13 has a highly inclined
>orbit, but the actual Apogee is at about 6 degrees North. Despite this,
>it is quite possible for you to use it, as it is very high at apogee,
>over 40km.

Isn't that 40,000 km?

>Sometimes, people get by with omnis on a few sats, but FAR better results
>are gained from a directional setup with a G-5400 rotor set. From here, I
>would suggest you buy or borrow the Satellite Experimenters Handbook.
>It's got it all.

It is pretty easy to hear sats with omnis, but harder to work them.

-Thomas

2201. Re: Geos-Tap Question

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 20:10:53 UTC
From: Chris Oesterling <chris@angus.mystery.com>
Message-ID: <u9iyXc1w165w@angus.mystery.com>
Source record: 26305

DVRobson@ix.netcom.com (David Robson) writes:

> I understand how APT images are generated and sent from NOAA LEO
> satellites and WEFAX is sent from GEOS geostationary satellites but
> recently I have heard of GEOS TAP. Is it a WEFAX image on C Band TV
> satellites? What kind of receiver is required to receive GEOS TAP
> images? I'm interested to see if I can add something to my C band/Ku
> band system and get WEFAX. Is that a feasible proposition. Any
> information would be appreciated.
>
> David Robson

SPACENET 3 transponder 17 on subcarriers 1.568MHz for MetoSat 4, 1.886MHz
for Goes-Tap-West, and 1.926MHz for Goes-Tap-East. (Yes your home C-band
system can receive these). - Chris

--
Chris Oesterling (chris@angus.mystery.com)
Mystery Spot BBS, Royal Oak, MI ----------?--

2202. SoundBlaster APT?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 20:18:44 UTC
From: Chris Oesterling <chris@angus.mystery.com>
Message-ID: <XLJyXc2w165w@angus.mystery.com>
Source record: 26306

I read here last week that on OAK.EDU was a program that could decode APT data via a SoundBlaster (somthing I was writing for Windows). I couldn't find it. Does anyone know where it is? Thanks, Chris (N8UDK) tech-lite.

--
Chris Oesterling (chris@angus.mystery.com)
Mystery Spot BBS, Royal Oak, MI ----------?--

2203. UHF AMP 4 SALE

Newsgroup: rec.radio.amateur.space
Date: 1994-12-26 20:28:23 UTC
From: MWRW76A@prodigy.com
Message-ID: <3dn917$4v0q@usenetp1.news.prodigy.com>
Source record: 26304

RF CONCEPTS 4-110 UHF AMP
10-15 WATTS IN 100 WATTS OUT.
EXC. CONDITION LIKE NEW 6 MONTHS OLD
$275.00 I SHIP US 48 STATE
H 810-247-0750 OR WORK 810-680-1970 GREAT FOR SATS USE
DOUG, KG8F

2204. What's The Address?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 03:28:34 UTC
From: jerry.gontang@digcir.cts.com
Message-ID: <941226221603109@digcir.cts.com>
Source record: 26308

You better check out the address for this letter and let everyone know that you can go another route for eMail. Please make a note of this and thank you.

2205. OSCAR 13

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 06:16:46 UTC
From: bobr@on-ramp.ior.com
Message-ID: <3dobge$ta@on-ramp.ior.com>
Source record: 26307

I have been off the OSCAR 13 satellite for almost a full year now. Getting ready to get back on since moving into a new house. Has the satellite deteriorated much in performance since I was last on?

Any information about the current state of the satellite would be helpful. Thanks.

Bob, KG7WC

--


```
+--------------------+-----------------------+-------------------------+
| Robert J. Raymond | Spokane, Washington | bobr@on-ramp.ior.com |
| Patricia Raymond | Amateur Callsign KG7WC | 70235.430@compuserv.com |
+--------------------+-----------------------+-------------------------+
```

2206. Re: OSCAR 13

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 08:49:46 UTC
From: n7ryw@teleport.com
Message-ID: <3dokcp$plm@desiree.teleport.com>
Source record: 26309

In article <3dobge$ta@on-ramp.ior.com>, bobr@on-ramp.ior.com said...
>
>I have been off the OSCAR 13 satellite for almost a full year now.
Getting
>ready to get back on since moving into a new house. Has the satellite
>deteriorated much in performance since I was last on?
>
>Any information about the current state of the satellite would be
helpful.

Performance, so to speak, is just as it was. There is no more mode J, as the 70cm transmitter died. Mode S has caught on quite a bit, and is available at each apogee.

The big difference is that, although the satellite has the same inclination, the apogee is at only 6 degrees north latitude. This means that you will be anle to talk to stations that you never heard before (like Australia and New Zealand).

This also means that there will be times when the Sun is directly behind the satellite for much if its orbit. this has neccessitated a very steep angle of offpoint (or "Squint") at certain times of the year.

Overall, I think it is just as good. Sure, there are times when it is almost unuseable, but the increased availability of other stations at times makes up for it. I also very much like the increased Mode-S time. It's about time we got off our VHF backsides and got into the 90s (an opinion not universally shared).

My $.002 worth!

--
From Bill, n7ryw@teleport.com

2207. Re: Radio Astronomy info

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 09:46:06 UTC
From: tsmithers@cix.compulink.co.uk
Message-ID: <D1Gr4u.HxB@cix.compulink.co.uk>
Source record: 26310

Well this is the url quoted in the November 94 issue of the SARA journal.
Suggest mail to foster@macline.com for latest info.
Could also try the SETI Institute
hhtp://www.metrolink.com/seti/homepage.html
I expect there are links from there to SARA.

Trevor
tsmithers@cix.compulink.co.uk

2208. UTC

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 11:39:20 UTC
From: demetre@helios.intranet.gr
Message-ID: <3doud8$o8b@helios.intranet.gr>
Source record: 26111

CQ Netters...

I've been trying to use a sattelite tracking program but...
I'm stuck at the time zone :-(I'm EET+2, how do I convert
this time zone into UTC ??

Please reply via e-mail

demetre@intranet.gr

Merry Christmas...

2209. Re: NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 16:41:57 UTC
From: Paul Ruscher <ruscher@met.fsu.edu>
Message-ID: <3dpg4l$sqt@mailer.fsu.edu>
Source record: 26112

Can someone please post two-line elements for tonight's planned
launch of NOAA-J? TIA.
Paul Ruscher / FSU Meteorology & Florida EXPLORES! / Tallahassee

2210. NOAA J pre-launch elements (maybe?)

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 21:41:25 UTC
From: Paul Ruscher <ruscher@met.fsu.edu>
Message-ID: <3dq1m5$jkj@mailer.fsu.edu>
Source record: 26114
Cross-posted to: rec.radio.amateur.space,sci.geo.meteorology

These two-line elements seem to work in my tracking program, in the event that NOAA J launches tonight.

```
NOAA J
1 00001U 94362.42849520 .00000054 00000-0 29743-4 0 11
2 00001 98.8677 279.7991 0013209 292.2182 249.1315 14.11816432 10
```

Paul Ruscher / FSU Meteorology & Florida EXPLORES! / Tallahassee

2211. ARLS035 RS-15 in Orbit

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 21:54:38 UTC
From: w1aw@arrl.org
Message-ID: <$arls035.1994@ampr.org>
Source record: 26117
Cross-posted to: rec.radio.info,rec.radio.amateur.space

SB SPACE @ ARL $ARLS035
ARLS035 RS-15 in Orbit

ZCZC AS79
QST de W1AW
Space Bulletin 035 ARLS035
From ARRL Headquarters
Newington, CT December 27, 1994
To all radio amateurs

SB SPACE ARL ARLS035
ARLS035 RS-15 in Orbit

On December 26 at 0300 UTC, the Russian RS-15 satellite was launched from the Baikonur space center in Russia. The satellite was lofted into space by a "Rokot" launch vehicle. Rokot is a hybrid created from the first and second stages of an SS-19 intercontinental ballistic missle and a new third-stage booster known as "Briz."

RS-15 is only the second Amateur Radio satellite to include Mode A capability (the other is RS-10). The satellite is already operating and several hams report successful contacts.

RS-15 transponder frequencies:

Uplink: 145.858 to 145.898 MHz
Downlink: 29.354 to 29.394 MHz
CW Beacon 1: 29352.5 kHz
CW Beacon 2: 29398.7 kHz

Modes are CW and SSB only.

W1AW will transmit RS15 Keplerian elements when accurate orbital data becomes available.

The RS-15 command station invites signal reports and comments:

RS3A
PO Box 59
Moscow 105122,
Russia

Internet e-mail: rsgroup@olymp.msk.su
Packet: RS3A@RS3A.MSK.RUS.EU
NNNN
/EX

2212. Re: Hubble Space Telescope

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 22:08:22 UTC
From: rdcole@crl.com
Message-ID: <3dq38m$o0q@crl10.crl.com>
Source record: 26116

Et2 Rich Sheff (n9315@pnet16.navy.mil) wrote:
: Although I don't remeber all the important info, HST uses the TDRS
: system to relay its data to the Earth stations. If I remeber correctly,
: this happens in the microwave range, at about 5 GHz.

It was my understanding that the TDRS downlink was in the Ku band. The
Signal is a digital data stream, T3 I think.

Ron Cole Internet:rdcole@crl.com ICBM:29 31.03 N
N5HYH CIS:70325,102 98 25.55 W
CE KZEP/KHBL AX25:N5HYH @ K3WGF.STX.NA

2213. PACSAT infor sources & subroutines

Newsgroup: rec.radio.amateur.space
Date: 1994-12-27 23:34:28 UTC
From: lsn92@ecs.soton.ac.uk
Message-ID: <3dq8a4$f2r@monet.ecs.soton.ac.uk>
Source record: 26113
Cross-posted to: uk.radio.amateur,rec.radio.amateur.space
Body handling: HTML body converted to readable text

Hi there,

I am looking for the latest PACSAT related information sources. Are
there any ftp site or web pages or email addresses for this matter?

I am new to packet radio communications to start with. But I am
interested in collected data from the PACSATs. So I wish to find out the
answers for the following basic questions:

1. Are these satellites PACSAT? UO-22, KO-23, KO-25, PO-28.
I am interested in these because they have FM downlink and is very
easy to track. Are there anymore PACSAT not listed above?
Or do all PACSAT have FM downlink at 9600 baud by definition?

2. I read the PACSAT documentation which was produced University of
Surrey a few years ago. It briefly mentioned UO-14 and UO-22. I
understand that these PACSATs worked in two mode: File Server and
Broadcast. I am interested in Broadcast specifically. I would like to
know if anybody has experience in working with the Broadcast mode of
these PACSATs.
Do KO-23 and KO-25 have the same Broadcast mode?

3. What I plan to do is to write a program for automatic collection of
the broadcast frames from the PACSATs. I understand that each broadcast
frame looks something like this:

0xbb

The procedures of my program are:

collect all broadcast frames from the PACSAT
save all the frames in a temporary file

process the temporary file
sort the frames
restore the PACSAT files
extract 'original' files from the PACSAT files

Has anyone written any programs or algorithms for all or part of the
procedures?

I understand that Surrey produced a program called PB. I would like to
be able to track and download frames from multiple PACSATs
automatically (unmanned for extended period of time).

4. About TNC and PC (serial port) interfacing. I used a Tiny-2 TNC with a 9600 baud modem.
How many bps should the serial port speed be? Ideally it should be faster than the 9600 downlink speed.
What is meant by KISS mode and AX.25 Unconnected mode used by the PACSAT? Shall I set the TNC to KISS mode in order to receive the frames from the PACSAT? Do frames and AX.25 Unconnected mode mean the same thing?
On top of the frame received from the PACSAT, what headers and trailers does the TNC add to it before sending it down the serial port to the PC?

Thanks in advance,

Yours,
Liang S. Ng
Southampton

2214. Re: PACSAT infor sources & subroutines

Newsgroup: rec.radio.amateur.space
Date: 1994-12-28 01:36:26 UTC
From: n7ryw@teleport.com
Message-ID: <3dqfcc$mbs@desiree.teleport.com>
Source record: 26118
Cross-posted to: uk.radio.amateur,rec.radio.amateur.space

In article <3dq8a4$f2r@monet.ecs.soton.ac.uk>, lsn92@ecs.soton.ac.uk
said...
<snip>
>1. Are these satellites PACSAT? UO-22, KO-23, KO-25

No. By the usual defunition, they are "UO-Sats", but that is not
universal. The Pacsats are 1200 bps and use psk on the downlink, which
needs an SSB radio.

>3. What I plan to do is to write a program for automatic collection of
>the broadcast frames from the PACSATs.
<snip>
>Has anyone written any programs or algorithms for all or part of the
>procedures?
>
>I understand that Surrey produced a program called PB.

Yes, it is the DOS standby, used for many years. It is available through
the Amsat organizations.

For the last year or so, almost everyone is using Wisp (Windows Satellite
Packet). It is a very sophisticated program that does everything you
would want and much more, so there's no need for you to re-invent that
wheel. You can get Wisp from:

ftp.amsat.org

I don't remember the directory there, but it is easy to find.
--
From Bill, n7ryw@teleport.com

2215. AO-13 Mode B is OFF MA 130 to 160!!!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-28 02:23:34 UTC
From: n7ryw@teleport.com
Message-ID: <3dqi4i$qgs@desiree.teleport.com>
Source record: 26119

I am listening to my S band on AO-13, and I am, frankly, quite irritated. There is some LID there trying to get Mode B to work by holding his iambic down.

I am sure that this has been said more than once, but the Mode B transponder is OFF from MA 130 to MA 160. Transmitting on mode B uplink causes severe QRM into Mode S. Please, before you transmit, listen and see if there is anyone on the downlink. If there isn't, look up the schedule!!!

The AGC is getting hammered by this guy. It sounds like a machine gun being shot ten feet away. BTW, due to the spacecraft design, the 145.812 beacon is ON during Mode S transponder, so don't depend on it!

Sorry for the diatribe, but it is too consistant, and getting on my nerves...

--
From Bill, n7ryw@teleport.com

2216. Re: AmSoft 1/95 CD-ROM Press Release 1

Newsgroup: rec.radio.amateur.space
Date: 1994-12-28 04:11:17 UTC
From: amsoft@epix.net
Message-ID: <3dqoh5$580@grape.epix.net>
Source record: 26115

>Please learn to cross post. If you had I would have seen this
>only in one newsgroup. As it is I downloaded 4 copies of this
>post. I don't know if your CD-Rom is that good but because of
>your clueless posting I would not buy it anyway. I do have a CD-
>rom drive.
>Rod Anderson aka Mr. Nice Guy N0NZO

The last cross posting resulted in the death of Jesus.
I guess "Mr.Nice Guy" really means BOZO not N0NZO.

+
+|+
||| Ill pray for you Rod...........

2217. Re: AO-13 Mode B is OFF MA 130 to 160!!!!!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-28 17:18:02 UTC
From: rdcole@crl.com
Message-ID: <3ds6ka$7le@crl12.crl.com>
Source record: 26121

William Roth (n7ryw@teleport.com) wrote:
: I am listening to my S band on AO-13, and I am, frankly, quite irritated.
: There is some LID there trying to get Mode B to work by holding his
: iambic down.

: The AGC is getting hammered by this guy. It sounds like a machine gun
: being shot ten feet away. BTW, due to the spacecraft design, the 145.812
: beacon is ON during Mode S transponder, so don't depend on it!

: Sorry for the diatribe, but it is too consistant, and getting on my
: nerves...

Some people have no idea what damage they are doing.

See you on Mode S

Ron
N5HYH

2218. RS-15 TLE

Newsgroup: rec.radio.amateur.space
Date: 1994-12-28 19:50:59 UTC
From: ROBERTSM@JSC.MIL
Message-ID: <sf017b75.001@JSC.MIL>
Source record: 26122

```
Following is a two line element set that provides AOS/LOS times
within 3 minutes of actual AOS/LOS using STSPLUS.
RS-15
1 23439U 94085A 94361.17042135 -.00000043 00000-0 00000+0 0 81
2 23439 64.8325 173.1633 0187416 292.2585 65.8559 11.27110522 128

Good luck and see you on the birds.
73 Mel W3MR robertsm@jsc.mil
```

2219. Re: NOAA-J

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 00:46:30 UTC
From: eareckso@netcom.com
Message-ID: <eareckso D1JrHJ.ACE@netcom.com>
Source record: 26124

Paul Ruscher (ruscher@met.fsu.edu) wrote:
: Can someone please post two-line elements for tonight's planned
: launch of NOAA-J? TIA.
: Paul Ruscher / FSU Meteorology & Florida EXPLORES! / Tallahassee

Scrubbed again due to high winds aloft, next try Dec. 29th.

2220. Re: SoundBlaster APT?

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 00:48:41 UTC
From: eareckso@netcom.com
Message-ID: <earecksoD1JrL5.AHs@netcom.com>
Source record: 26125

Chris Oesterling (chris@angus.mystery.com) wrote:
: I read here last week that on OAK.EDU was a program that could decode APT
: data via a SoundBlaster (somthing I was writing for Windows). I couldn't
: find it. Does anyone know where it is? Thanks, Chris (N8UDK) tech-lite.

: --
: Chris Oesterling (chris@angus.mystery.com)
: Mystery Spot BBS, Royal Oak, MI ----------?--

Try ftp: kestrel.umd.edu pub/wxsat/programs

SBDSP11.ZIP

2221. RS-15 Keps from Goddard Space Flight Center

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 02:02:35 UTC
From: djmullen@facstaff.wisc.edu
Message-ID: <3dt5br$erd@news.doit.wisc.edu>
Source record: 26127

Goddard's Orbital Information Group (OIG) now lists RS-15 elements!

They list RS-15 as:

NORAD: 23439
ID: 1994 085A

and give the elements below.

```
RS-15
1 23439U 94085A 94360.46109954 -.00000043 00000-0 00000+0 0 52
2 23439 64.8213 174.3145 0172275 289.9048 70.3595 11.27225775 48
RS-15
1 23439U 94085A 94360.54932454 -.00000043 00000-0 00000+0 0 61
2 23439 64.8272 174.1675 0174533 290.6262 67.5949 11.27197257 50
RS-15
1 23439U 94085A 94360.81551574 -.00000043 00000-0 00000+0 0 72
2 23439 64.8318 173.7384 0185796 292.0947 66.0382 11.27116428 81
RS-15
1 23439U 94085A 94361.17042135 -.00000043 00000-0 00000+0 0 81
2 23439 64.8325 173.1633 0187416 292.2585 65.8559 11.27110522 128
RS-15
1 23439U 94085A 94361.79150546 -.00000042 00000-0 00000+0 0 95
2 23439 64.7969 172.2340 0224189 305.4085 10.0588 11.19236494 196
```

OIG's telnet address is: oig.gsfc.nasa.gov Logon: oig PW: goddard1

Dave, N9LTD

2222. Re: FREE HAM NEWSLETTER

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 04:21:53 UTC
From: bob@raddev.com
Message-ID: <3dtdh2$dj7@remus.ultranet.com>
Source record: 26123
Cross-posted to: rec.radio.swap,rec.radio.shortwave,rec.radio.scanner,rec.radio.amateur.space,rec.radio.amateur.policy,rec.radio.amateur.misc,rec.radio.amateur

In article <3dt4vu$reb@grape.epix.net>, AMSOFT@EPIX.NET says:
>
>
>Includes FCC CALLSIGN callbook with US & Foeriegn listings current to
>12/94, and AMCALL the new logbook from AmSoft that will auto log from

> Pete, KC3TL
Pete,

Which foreign countries are included on your CDROM?

Bob

==========
Radio Devices email for complete cdrom catalog
32 Queens View Road QRZ! $14.95, Buckmaster $42.95
Marlboro, MA 01752 Linux, OS/2, MAC, Windows, Unix
(508)480-0502 KD1GG Ramsey Kits, Antennas West (Ham)
==========

2223. FREE HAM NEWSLETTER

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 04:33:00 UTC
From: AMSOFT@EPIX.NET
Message-ID: <3dt4vu$reb@grape.epix.net>
Source record: 26126
Cross-posted to: rec.radio.swap,rec.radio.shortwave,rec.radio.scanner,rec.radio.amateur.space,rec.radio.amateur.policy,rec.radio.amateur.misc,rec.radio.amateur.homebrew,rec.radio.amateur.equipment,rec.radio.amateur.digital.misc,rec.radio.amateur.antenna

The Jan 95 "The World of Ham Radio" CD-ROM is now available from AmSoft.
This CD-ROM offers more ham programs than any of the others out there!
Over 20,000 IBM files for amateur radio are included on the CD-ROM.
Includes FCC CALLSIGN callbook with US & Foeriegn listings current to
12/94, and AMCALL the new logbook from AmSoft that will auto log from
the CD for you. Over 1,350 Radio Mods. The latest HST images available.
Over 700 Megabytes of Amateur Radio Software packed into 1 CD.

This CD-ROM is published every 4 months without delay in JAN MAY & SEP

If you would like to get a FREE newsletter about the January 1995 AmSoft
CD-ROM please leave me your E-mail information at: amsoft@epix.net

Pete, KC3TL

2224. PRO-46 mods

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 09:26:01 UTC
From: t9456079@minyos.xx.rmit.EDU.AU
Message-ID: <3dtvb9$fqv@aggedor.rmit.EDU.AU>
Source record: 26128

Purchased a pro-46 and see that the 29mhz band is available in Canadian models but not the Australian model. Any easy way to bring this band back to the australian models ?.

```
+--------------------------------------+
| John Elliott VK3CVF |
+--------------------------------------+
```

2225. Re: NOAA-J launch

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 16:58:47 UTC
From: Paul Ruscher <ruscher@met.fsu.edu>
Message-ID: <3dups7$1fm@mailer.fsu.edu>
Source record: 26129
Cross-posted to: rec.radio.amateur.space,sci.geo.meteorology

NOAA J was delayed again this morning due to strong surface winds
which prevented the servicing crew from removing the service tower
from the Atlas-B rocket. Rescheduled for Friday morning at
2:02 PST.
Paul Ruscher / FSU Meteorology & Florida EXPLORES! / Tallahassee

2226. GOES TAP FORMAT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-29 21:54:24 UTC
From: durham@lobby.ti.com
Message-ID: <3dvb6g$nhd@superb.csc.ti.com>
Source record: 26130

I have been unable to find the GOES TAP signals on Spacenet 3, TR17 by mixing the baseband output from
my satellite receiver up 100Mhz and listening around 1.9Mhz with an FM broadcast receiver. There is no
detectable signal near this frequency. Other subcarriers start at about 3Mhz and others can be heard up to
7.2Mhz. These are all music or TV sound however.

Does anyone know what the FM deviation is supposed to be for the GOES TAP service? Is there any video
on transponder 17? I see some weak scrambled signal that may be bleedover from TR16 or TR18.

Are there any published circuits or techniques for obtaining the APT signal? None of the books that
have been recommended were any help. The Ralph Taggert books just mention the subject in passing with
no explanation of the format. The frequencys have been posted several times in this Newsgroup, so they
must be correct but something is wrong with my setup.

Please post here if you think others may have an interest in the subject, or e-mail me at the address
below.

Ken Durham K5MBV durham@lobby.ti.com

2227. Re: GOES TAP FORMAT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 07:51:07 UTC
From: stearns@aztec.inre.asu.edu
Message-ID: <3e0e5b$309@news.asu.edu>
Source record: 26132

Ken,

The GOES TAP signals that you are looking for are narrow band FM signals. Listening for them with a commercial FM receiver will be fruitless. I have received them with an R-7000 after mixing the baseband video out of the TVRO output into the R-7000's passband. But even with this setup, you'd be as dissappointed as I was at first. The bandwidth of the GOES TAP signals are wider than normal narrow band FM and carrier dropout occurs at high deviation levels. The best receiving system I've pu together is to mix the video baseband spectrum into the receiving band of my normal APT receiver which covers 136-138 MHz. The bandwidth of the APT receiver is a good match for the GOES TAP signals. Now,

After you get to this point, your up against another issue. GOES TAP uses inverted grey scales and scans from right to left. If your scan converter software can deal with this, then your allright. However, most commercial suppliers of APT equipment don't offer GOES TAP capability in order to avoid legal issues with Alden WX Service, those that produce this service on the satellite. If your scna converter is real flexible, maybe you can capture the images properly. By the way, they're the best images your gonna ever find.

Good luck.
Ned Stearns AA7A

2228. Now it is NOAA-14!

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 10:27:12 UTC
From: peter.henne@gmd.de
Message-ID: <peter.henne-301294111843@oskar.gmd.de>
Source record: 26131

```
NOAA-J was successfully lauched from Vandenberg AFB
today Friday, DEC 30 1994 at 10:02:10 UT, now NOAA-14
in orbit. A 21-day checkout period begins, lets
keep our fingers crossed.
Congratulations to all, and thanks to Michael Baldizzi
who provided live NASA-TV-coverage on CU-Seeme.

+----------------------------------------+
|Peter Henne (peter.henne@gmd.de) |
| (henne@gmd.de) |
|German Nat.Research Center.f.Comp.Science |
|D-53754 St.AUGUSTIN, Germany |
+----------------------------------------+
```

2229. re GOES TAP move to Ku band

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 12:46:36 UTC
From: ken@sislnews.csc.ti.com
Message-ID: <941230124636@ken_durham.linear.sc.ti.com>
Source record: 26138

Kevin

Your posting did not include your name for a return address, so I'll ask my question here. The information may be useful to others also. Do you know which Ku band Satellite and transponder is to be used for the GOES TAP service? Also, what is FM3 and is it possible to detect and decode it for the weather pictures?
Thanks to you and Ned for the answers you posted. I was beginning to think I was listening to the wrong Satellite since there was NO detectable signal near 1.9Mhz on S3 tr17 baseband .....no quieting ....nothing.

Ken K5MBV drham@lobby.ti.com

2230. Re: GOES TAP FORMAT

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 14:29:48 UTC
From: Margaret Shea <mashea@students.wisc.edu>
Message-ID: <3e15gs$rch@news.doit.wisc.edu>
Source record: 26133

stearns@aztec.inre.asu.edu (NED STEARNS) wrote:
>
>
> Ken,
>
> The GOES TAP signals that you are looking for are narrow band FM signals.
>....
> However, most commercial
> suppliers of APT equipment don't offer GOES TAP capability in order to
> avoid legal issues with Alden WX Service, those that produce this service on
> the satellite. If your scna converter is real flexible, maybe you can capture
> the images properly. By the way, they're the best images your gonna ever find.
>
> Good luck.
> Ned Stearns AA7A
I think there's even a bigger problem. Alden announced some
time ago that it was leaving C band and moving to Ku band for
its services. Alden was also going to be using FM3 type encoding.
I have not heard that the "analog" in the clear GOES-TAP made the
switch. It was suppose to be 12-1-94.

I checked last week and am checking right now and I am not getting any
signal from Alden's old spot on S3.

Sorry for the bad news, the good news is there's lots of other sources for
weather satellite stuff and today NOAA J was launched and I'm hoping NASA/NOAA
has it fired up so I can listen to it later this morning.

73,
Kevin N9JKP

2231. KEP for RS-15

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 16:20:59 UTC
From: bjp@cle.ab.com
Message-ID: <3e1c1b$8e2@news1.cle.ab.com>
Source record: 26134

and was working a QSO last night and someone broke in and asked about RS-15. I never heard of RS-15 I told him.

So if someone out there can help, please email me the kep file and what freqs to work the bird.

73

Brian N8RPA

2232. Re: ARLS035 RS-15 in Orbit

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 16:48:43 UTC
From: pete@freenet.grfn.org
Message-ID: <3e1dlb$19e@locutus.Bethany.ORG>
Source record: 26135

```
w1aw@arrl.org wrote:
:
: On December 26 at 0300 UTC, the Russian RS-15 satellite was launched

: and several hams report successful contacts.

: W1AW will transmit RS15 Keplerian elements when accurate orbital
: data becomes available.

Very Cool. If anyone gets the Keps, please post them right away!
Thanks!

--
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
Pete Hoffswell |pete@grfn.org |616-336-2304
Holland, Michigan |N9SSA |http://www.grfn.org/~pete
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
```

2233. NOAA 14 images and information

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 18:07:06 UTC
From: Paul Ruscher <ruscher@met.fsu.edu>
Message-ID: <3e1i8a$hr8@mailer.fsu.edu>
Source record: 26136
Cross-posted to: rec.radio.amateur.space,sci.geo.meteorology

NOAA 14 was launched successfully today from Vandenberg AFB and a look at its first Automatic Picture Transmission images (4 km resolution) can be found on the Florida EXPLORES! home page at

http://thunder.met.fsu.edu/explores/explores.html

You will also find a NOAA Satellite Resource Guide there, which includes information about all NOAA satellites, including NOAA 14.

Happy New Year!

Paul Ruscher / FSU Meteorology & Florida EXPLORES! / Tallahassee

2234. Re: KEP for RS-15

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 18:46:55 UTC
From: pete@freenet.grfn.org
Message-ID: <3e1kiv$3kl@locutus.Bethany.ORG>
Source record: 26137

```
See a couple of messages back for freqs. Here's the Keps I found,
the source said they were from goddard:

RS-15
1 23439U 94085A 94361.17042135 -.00000043 00000-0 00000+0 0 82
2 23439 64.8325 173.1633 0187416 292.2585 65.8559 11.27110522 128

:Above are the latest elements Icould find for RS-15.
:These are from the NASAGoddardSpace Flight Center.
:There has been a LOT ofconfusion aboutthe elements for this bird!

--
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
Pete Hoffswell |pete@grfn.org |616-336-2304
Holland, Michigan |N9SSA |http://www.grfn.org/~pete
-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
```

2235. Two-Line Orbital Element Set Format

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 22:33:14 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.788826794@falcon>
Source record: 26139

As a service to the satellite user community, the following description of the NORAD two-line orbital element set format is uploaded to sci.space.news and rec.radio.amateur.space on a monthly basis. The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (205) 409-9280, and are updated several times weekly. Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity. In addition, element sets (updated weekly) and some documentation and software are also available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

==========

Data for each satellite consists of three lines in the following format:

```
AAAAAAAAAAAAAAAAAAAAA
1 NNNNNU NNNNNAAA NNNNN.NNNNNNNN +.NNNNNNNN +NNNNN-N +NNNNN-N N NNNNN
2 NNNNN NNN.NNNN NNN.NNNN NNNNNNN NNN.NNNN NNN.NNNN NN.NNNNNNNNNNNNN
```

Line 0 is a twenty-two-character name (this change is being made to be consistent with the name length in the NORAD SATCAT).

Lines 1 and 2 are the standard Two-Line Orbital Element Set Format identical to that used by NORAD and NASA. The format description is:

```
Line 1
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
10-11 International Designator (Last two digits of launch year)
12-14 International Designator (Launch number of the year)
15-17 International Designator (Piece of launch)
19-20 Epoch Year (Last two digits of year)
21-32 Epoch (Julian Day and fractional portion of the day)
34-43 First Time Derivative of the Mean Motion
or Ballistic Coefficient (Depending on ephemeris type)
45-52 Second Time Derivative of Mean Motion (decimal point assumed;
blank if N/A)
54-61 BSTAR drag term if GP4 general perturbation theory was used.
Otherwise, radiation pressure coefficient. (Decimal point assumed)
63-63 Ephemeris type
65-68 Element number
69-69 Check Sum (Modulo 10)
(Letters, blanks, periods, plus signs = 0; minus signs = 1)
```

Line 2
Column Description
01-01 Line Number of Element Data
03-07 Satellite Number
09-16 Inclination [Degrees]
18-25 Right Ascension of the Ascending Node [Degrees]
27-33 Eccentricity (decimal point assumed)
35-42 Argument of Perigee [Degrees]
44-51 Mean Anomaly [Degrees]
53-63 Mean Motion [Revs per day]
64-68 Revolution number at epoch [Revs]
69-69 Check Sum (Modulo 10)

All other columns are blank or fixed.

Example:

NOAA 6
1 11416U 86 50.28438588 0.00000140 67960-4 0 5293
2 11416 98.5105 69.3305 0012788 63.2828 296.9658 14.24899292346978
--
Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology

2236. Two-Line Orbital Element Sets (TLE527)

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 22:35:17 UTC
From: tkelso@afit.af.mil
Message-ID: <tkelso.788826917@falcon>
Source record: 26140

The most current orbital elements from the NORAD two-line element sets are carried on the Celestial BBS, (205) 409-9280, and are updated daily (when possible). Documentation and tracking software are also available on this system. The Celestial BBS may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

Element sets (also updated daily) and some documentation and software are available via anonymous ftp from archive.afit.af.mil (129.92.1.66) in the directory pub/space.

As a service to the satellite user community, the most current of these elements are uploaded weekly to sci.space.news and rec.radio.amateur.space. This week's elements are provided below.

```
- Current Two-Line Element Sets #527 -
Alouette 1
1 00424U 62049A 94362.26021776 .00000064 00000-0 65577-4 0 676
2 00424 80.4664 93.5334 0022558 338.1094 21.9086 13.67829046608935
ATS 1
1 02608U 66110A 94355.80818491 -.00000177 00000-0 10000-3 0 9186
2 02608 14.6199 358.5060 0007840 51.8855 308.2369 1.00319321 19412
ATS 3
1 03029U 67111A 94363.09041812 -.00000115 00000-0 10000-3 0 3143
2 03029 14.7573 5.4598 0010048 267.1080 112.0052 1.00272398 99394
Cosmos 398
1 04966U 71016A 94363.14359830 .00097027 74353-5 15246-3 0 6864
2 04966 51.4386 256.9466 0816587 243.3566 108.1520 14.38183685800277
Starlette
1 07646U 75010A 94361.70099673 -.00000149 00000-0 -65648-5 0 8528
2 07646 49.8285 109.7166 0205784 255.3280 102.4721 13.82187862 4627
LAGEOS
1 08820U 76039A 94364.15788040 .00000030 00000-0 10000-3 0 721
2 08820 109.8160 202.7113 0043852 243.2932 116.3336 6.38664169179669
ETS-2
1 09852U 77014A 94358.36954176 -.00000051 00000-0 10000-3 0 96
2 09852 12.4700 39.2310 0002028 88.3188 271.7029 1.00023511 12235
GOES 2
1 10061U 77048A 94363.39621514 .00000069 00000-0 00000+0 0 4720
2 10061 11.5431 43.3627 0002613 112.1619 309.2441 1.00263492 9079
IUE
1 10637U 78012A 94360.25156481 -.00000231 00000-0 00000+0 0 952
2 10637 34.8902 91.7893 1317898 41.5710 2.7191 1.00278567 14536
GPS BI-01
1 10684U 78020A 94358.06857124 -.00000024 00000-0 10000-3 0 3263
2 10684 64.7473 39.8893 0061973 163.6470 196.6085 1.98069489108698
```

```
GPS BI-02
1 10893U 78047A 94359.19951956 -.00000023 00000-0 10000-3 0 1343
2 10893 63.4172 278.3083 0218325 13.9944 346.6370 2.01627398121920
GOES 3
1 10953U 78062A 94363.66787093 .00000064 00000-0 10000-3 0 4339
2 10953 10.4928 46.1352 0004139 140.8327 336.9096 1.00255156 13686
SeaSat 1
1 10967U 78064A 94361.23340705 -.00000007 00000-0 42374-4 0 3632
2 10967 107.9980 141.6839 0002183 249.6145 110.4762 14.38001910864114
GPS BI-03
1 11054U 78093A 94362.03989385 -.00000029 00000-0 10000-3 0 2581
2 11054 63.0486 276.0130 0044168 176.7592 183.3023 1.93505733118263
Nimbus 7
1 11080U 78098A 94363.18078768 -.00000068 00000-0 -23050-4 0 4661
2 11080 99.0252 239.2314 0008900 334.2360 25.8346 13.83718622817040
GPS BI-04
1 11141U 78112A 94363.28680650 -.00000016 00000-0 00000+0 0 9512
2 11141 64.7454 41.2883 0048321 26.8718 333.4562 1.92894298 7540
GPS BI-05
1 11690U 80011A 94361.37214318 -.00000020 00000-0 10000-3 0 8704
2 11690 65.0908 41.4738 0142977 194.9241 164.7144 2.00560197123412
GPS BI-06
1 11783U 80032A 94357.71633900 -.00000011 00000-0 10000-3 0 460
2 11783 62.5742 271.8605 0214178 29.1401 332.0866 2.03456575107819
GOES 5
1 12472U 81049A 94363.12525990 -.00000214 00000-0 10000-3 0 8267
2 12472 7.2163 55.9397 0004966 23.1777 336.7464 1.00331062 7722
Cosmos 1383
1 13301U 82066A 94361.84453900 .00000027 00000-0 14642-4 0 3686
2 13301 82.9318 167.7736 0026249 282.9169 76.9054 13.68061976623906
LandSat 4
1 13367U 82072A 94361.57001758 .00000068 00000-0 25138-4 0 5932
2 13367 98.1518 56.3503 0007403 21.8089 338.3434 14.57141899662223
IRAS
1 13777U 83004A 94364.06151881 -.00000285 00000-0 -16652-3 0 8243
2 13777 98.9692 190.9177 0012425 132.8028 227.4181 13.99219554278530
Cosmos 1447
1 13916U 83021A 94361.12690919 .00000041 00000-0 27208-4 0 4661
2 13916 82.9453 228.9908 0036540 210.1559 149.7490 13.74318830589837
TDRS 1
1 13969U 83026B 94358.86067576 -.00000187 00000-0 10000-3 0 3828
2 13969 8.0587 49.1320 0005803 171.7316 267.3944 1.00277347 15966
GOES 6
1 14050U 83041A 94362.40157899 .00000079 00000-0 00000+0 0 3262
2 14050 6.0107 58.9938 0002258 345.9051 61.9116 1.00274483100815
OSCAR 10
1 14129U 83058B 94362.30354351 -.00000400 00000-0 10000-3 0 3330
2 14129 26.6502 290.8469 6024517 239.2864 48.4317 2.05884111 58816
LandSat 5
1 14780U 84021A 94363.18592485 .00000046 00000-0 20052-4 0 1751
```

```
2 14780 98.1387 58.7927 0005290 25.7850 334.3611 14.57148801575871
UoSat 2
1 14781U 84021B 94362.05077029 .00000121 00000-0 28260-4 0 7635
2 14781 97.7808 7.6562 0012487 14.5055 345.6503 14.69288118578778
GPS BI-09
1 15039U 84059A 94363.11577109 -.00000016 00000-0 10000-3 0 2636
2 15039 64.4231 35.7062 0081504 16.4568 343.8679 1.92301586 77123
Cosmos 1574
1 15055U 84062A 94364.23475966 .00000047 00000-0 33532-4 0 6688
2 15055 82.9564 280.4583 0029059 32.7240 327.5703 13.73615525527543
GPS BI-10
1 15271U 84097A 94362.57464975 -.00000020 00000-0 00000+0 0 9032
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RS-10/11
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2 19883 0.0396 193.8085 0002325 34.6295 216.5013 1.00267965193663
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TDRS 5
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2 22314 1.5054 73.2180 0001627 184.3095 347.1386 1.00279800 7215
GPS BIIA-18
1 22446U 93007A 94360.83154574 -.00000060 00000-0 00000+0 0 4920
2 22446 54.5839 309.4250 0082125 348.4845 11.3187 2.00558281 13760
Glonass 59
1 22512U 93010A 94358.64652771 .00000023 00000-0 00000+0 0 6713
2 22512 64.9703 102.5109 0009097 191.1497 168.8413 2.13102049 14174
Glonass 60
1 22513U 93010B 94363.27882923 -.00000019 00000-0 00000+0 0 6955
2 22513 64.9600 102.3636 0007822 196.3558 163.6182 2.13102373 14461
Glonass 61
1 22514U 93010C 94362.10818341 -.00000012 00000-0 00000+0 0 6807
2 22514 64.9707 102.3945 0014224 190.8547 169.1154 2.13101422 14446
ASTRO-D
1 22521U 93011A 94364.14020621 .00000681 00000-0 51936-4 0 3704
2 22521 31.1041 284.9577 0075757 208.2149 151.4374 14.93505152101410
UFO F1
1 22563U 93015A 94364.11646975 -.00000039 00000-0 10000-3 0 3767
2 22563 26.2987 296.8855 0007826 308.7690 159.7432 0.99248017 10780
GPS BIIA-19
1 22581U 93017A 94360.97458767 -.00000044 00000-0 00000+0 0 3849
2 22581 55.1729 9.7783 0051582 34.8087 325.5679 2.00556619 12828
ARSENE
1 22654U 93031B 94354.83204129 -.00000098 00000-0 00000+0 0 3002
2 22654 2.2328 90.8459 2910364 199.5607 145.6727 1.42203020 3857
GPS BIIA-20
1 22657U 93032A 94364.10706365 -.00000053 00000-0 00000+0 0 4132
2 22657 55.1711 9.4515 0066767 206.2203 153.4688 2.00573242 8216
RADCAL
1 22698U 93041A 94363.20947837 .00000071 00000-0 25898-4 0 3672
2 22698 89.5456 299.3430 0089292 272.7520 86.3457 14.21331409 78298
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GPS BIIA-21
1 22700U 93042A 94360.08087969 .00000009 00000-0 00000+0 0 3709
2 22700 54.4127 250.3601 0034245 333.8065 26.0948 2.00560495 10932
NOAA-13
1 22739U 93050A 94363.87292973 .00000055 00000-0 55943-4 0 6898
2 22739 98.9713 307.7080 0009325 295.5122 64.5081 14.10919295 71566
GPS BIIA-22
1 22779U 93054A 94361.66160246 -.00000064 00000-0 10000-3 0 4183
2 22779 54.6921 309.3305 0023215 243.8476 115.9286 2.00556801 9723
Meteor 2-21
1 22782U 93055A 94360.23056884 .00000062 00000-0 43257-4 0 3684
2 22782 82.5490 54.2643 0023922 49.4020 310.9211 13.83022449 66636
UFO F2
1 22787U 93056A 94362.79514654 -.00000054 00000-0 00000+0 0 3717
2 22787 4.7222 323.2300 0004090 284.0325 207.4571 1.00269526 5041
SPOT 3
1 22823U 93061A 94363.89046429 .00000002 00000-0 21360-4 0 3849
2 22823 98.6975 75.2312 0001441 69.3186 290.8126 14.20040165 65266
STELLA
1 22824U 93061B 94363.38241485 -.00000034 00000-0 40557-5 0 3568
2 22824 98.6381 76.8377 0006978 5.7629 354.3633 14.27099551 65519
AO-27
1 22825U 93061C 94364.19588153 -.00000002 00000-0 17069-4 0 3594
2 22825 98.6366 77.8557 0008724 2.5345 357.5880 14.27646793 65655
IO-26
1 22826U 93061D 94360.23799017 .00000025 00000-0 28081-4 0 3566
2 22826 98.6374 74.0142 0009759 14.0258 346.1189 14.27752933 65092
HEATHSAT
1 22827U 93061E 94364.19756976 .00000023 00000-0 27210-4 0 4194
2 22827 98.6345 77.8774 0009397 350.4664 9.6343 14.27870756 65669
ITAMSAT
1 22828U 93061F 94364.19788759 -.00000008 00000-0 14625-4 0 3367
2 22828 98.6330 77.9519 0010360 348.0472 12.0465 14.28081413 33757
PO-28
1 22829U 93061G 94360.21319314 .00000028 00000-0 28846-4 0 3501
2 22829 98.6341 74.0370 0010561 359.9147 0.2026 14.28057393 65102
KO-25
1 22830U 93061H 94361.18607604 .00000042 00000-0 34202-4 0 3657
2 22830 98.5369 70.1242 0011558 334.9907 25.0715 14.28078699 65249
GPS BIIA-23
1 22877U 93068A 94360.21368660 -.00000038 00000-0 00000+0 0 2248
2 22877 55.3301 70.7349 0036048 291.6631 67.9928 2.00559770 8581
METEOSAT 6
1 22912U 93073B 94363.22492848 -.00000074 00000-0 00000+0 0 2064
2 22912 0.4915 265.7704 0002822 313.7477 309.5394 1.00273885 2485
HST Array
1 22920U 90037C 94361.50544318 .00006222 00000-0 48875-3 0 2627
2 22920 28.4720 50.8727 0004035 158.0836 201.9937 14.98964065 58503
Meteor 3-6
1 22969U 94003A 94362.83799728 .00000051 00000-0 10000-3 0 1342
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2 22969 82.5569 278.9104 0016045 134.2298 226.0133 13.16726276 44467
TUBSAT-B
1 22970U 94003B 94363.19236925 .00000051 00000-0 10000-3 0 1248
2 22970 82.5572 278.6190 0016614 131.2124 229.0439 13.16823523 44513
ODERACS E
1 22994U 94006F 94362.47170769 .00089674 13887-4 18560-3 0 2272
2 22994 56.9773 156.6801 0007891 153.8804 206.2282 15.99181809 50970
ODERACS F
1 22995U 94006G 94364.22841680 .00104346 15184-4 19556-3 0 2772
2 22995 56.9768 147.8523 0005154 155.6609 204.5085 16.00864587 51260
BREMSAT
1 22998U 94006H 94362.50772027 .00122954 17110-4 20980-3 0 2669
2 22998 56.9820 157.0134 0003392 146.2464 213.8689 16.02406461 34821
GPS BIIA-24
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2 23027 55.0321 11.6336 0066250 196.0088 163.8365 2.00571599 5929
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Glonass 63
1 23044U 94021B 94362.12545239 -.00000030 00000-0 00000+0 0 1326
2 23044 64.7807 342.6256 0029921 207.7511 152.1009 2.13103156 5567
Glonass 64
1 23045U 94021C 94362.30124913 -.00000031 00000-0 00000+0 0 1421
2 23045 64.7748 342.6325 0009759 29.2695 330.7965 2.13102795 5569
GOES 8
1 23051U 94022A 94362.54472167 -.00000176 00000-0 00000+0 0 2434
2 23051 0.3473 264.4275 0005080 6.8150 291.7999 1.00261870 2242
MSTI 2
1 23101U 94028A 94362.50250553 .00006577 00000-0 12510-3 0 1303
2 23101 97.1049 193.3074 0013141 146.3324 213.8772 15.48474551 36091
STRV-1A
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2 23125 7.1325 101.4143 7288031 339.4590 1.9382 2.29196067 3669
STRV-1B
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2 23126 7.1861 101.0322 7285904 341.2576 2.0588 2.28865474 3801
Nadezhda 4
1 23179U 94041A 94362.20007036 .00000043 00000-0 28819-4 0 666
2 23179 82.9461 274.5762 0035596 181.2435 178.8643 13.75661571 22967
Glonass 65
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2 23203 64.8200 222.1780 0007629 135.1589 224.9806 2.13102084 2958
Glonass 66
1 23204U 94050B 94361.73486997 .00000092 00000-0 00000+0 0 985
2 23204 64.8097 222.2236 0015517 351.7327 8.3201 2.13102189 2949
Glonass 67
1 23205U 94050C 94361.61770234 .00000091 00000-0 10000-4 0 898
2 23205 64.8204 222.2078 0001642 1.6601 358.4240 2.13102095 2942
DMSP B5D2-7
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1 23233U 94057A 94363.61382279 .00000108 00000-0 82243-4 0 1636
2 23233 98.9036 58.0537 0011646 258.4669 101.5192 14.12565796 17212
Soyuz TM-20
1 23288U 94063A 94363.98964590 -.00043408 00000-0 -55714-3 0 807
2 23288 51.6496 285.8812 0002221 78.5145 281.7187 15.58349270506534
OKEAN 1-7
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2 23317 82.5428 194.0256 0027799 31.2876 328.9970 14.73880844 11260
ELEKTRO
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Progress M-25
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Glonass 69
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2 23397 64.8795 102.4643 0012591 322.6859 37.2244 2.13102508 822
Glonass 70
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2 23398 64.8702 102.4818 0002608 271.1687 88.8012 2.13102073 811
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1 23412U 94078B 94362.27982325 .00000013 00000-0 22165-3 0 143
2 23412 73.6133 78.9552 0028531 246.1890 113.6154 12.41133882 3627
Orion 1
1 23413U 94079A 94343.43304867 -.00000288 00000-0 00000+0 0 179
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1 23416U 94080B 94363.85546985 .00013108 -29326-6 85159-3 0 222
2 23416 27.8280 302.7696 7313853 197.6153 108.6722 2.27026330 696
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1 23417U 94077H 94362.87489561 .00004772 00000-0 24573-2 0 158
2 23417 71.0002 176.2740 0015983 58.6405 301.6289 14.15585496 12561
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2 23419 71.0030 174.9960 0006711 198.4033 161.8590 14.14712509 14482
Molniya-1T
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1 23421U 94081B 94364.24861190 .00422775 80468-5 43553-3 0 342
2 23421 62.8088 187.7893 0117470 132.7653 228.3639 15.97535047 2490
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1 23423U 94081D 94350.10977767 .00000052 00000-0 10000-4 0 39
2 23423 62.7618 247.9664 7401591 280.0871 11.9102 2.05554713 47
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2 23426 2.5720 274.4385 0006682 42.2819 15.2486 1.00272745 123
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2 23427 51.6466 257.6009 0000550 220.8263 139.2942 16.51839879 490
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1 23428U 94082C 94351.10444535 .16355483 12349-4 10804-2 0 39
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2 23429 2.6472 275.9027 0023485 7.3101 353.6644 1.00808464 23
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1 23430U 94082E 94361.97756070 .00000162 00000-0 47873-3 0 70
2 23430 47.3724 270.9969 7244091 3.0414 359.6537 2.27579578 282
Cosmos 2298
1 23431U 94083A 94361.91038694 -.00000042 00000-0 -62899-5 0 88
2 23431 74.0286 160.6047 0016852 333.6849 26.3448 14.28116408 1108
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1 23432U 94083B 94363.85932065 .00007777 00000-0 30126-2 0 118
2 23432 74.0302 157.0235 0019002 355.1361 4.9749 14.30048427 1390
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1 23433U 94083C 94360.51498925 .00000138 00000-0 67617-4 0 33
2 23433 74.0159 163.1381 0012862 319.7418 40.2628 14.26837674 806
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1 23434U 94083D 94362.85124299 -.00000015 00000-0 48238-5 0 60
2 23434 74.0357 159.0338 0013337 228.9954 131.0032 14.23102317 1183
RS-15
1 23439U 94085A 94362.60621975 -.00000042 00000-0 00000+0 0 107
2 23439 64.7982 170.9390 0224393 305.3126 52.6969 11.19236697 283
1994085B
1 23440U 94085B 94361.79150546 -.00000043 00000-0 00000+0 0 21
2 23440 64.8297 172.1572 0188748 292.0126 66.1014 11.27113018 197
Cosmos 2299
1 23441U 94086A 94362.89950288 .00000029 00000-0 10000-3 0 91
2 23441 82.5674 97.5398 0009824 25.8824 334.2758 12.63497079 258
Cosmos 2300
1 23442U 94086B 94363.85183846 .00000029 00000-0 10000-3 0 75
2 23442 82.5635 96.9309 0004562 20.3816 339.7456 12.62566061 371
Cosmos 2301
1 23443U 94086C 94362.90184791 .00000028 00000-0 10000-3 0 92
2 23443 82.5736 97.5478 0003162 340.4894 19.6068 12.61960268 251
Cosmos 2302
1 23444U 94086D 94363.22066675 .00000028 00000-0 10000-3 0 55
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2 23444 82.5671 97.3394 0005360 248.9203 111.1316 12.60997095 298
Cosmos 2303
1 23445U 94086E 94362.34871528 .00000028 00000-0 10000-3 0 48
2 23445 82.5791 97.9045 0009156 236.2973 123.7710 12.60260510 182
Cosmos 2304
1 23446U 94086F 94364.24971506 .00000028 00000-0 10000-3 0 69
2 23446 82.5683 96.6816 0004449 306.9876 53.0836 12.61912452 423
1994086G
1 23447U 94086G 94362.34871528 .00000027 00000-0 10000-3 0 61
2 23447 82.5723 97.9063 0037341 235.7591 100.4745 12.55433397 185
1994087A
1 23448U 94087A 94362.85604001 -.00000190 00000-0 00000+0 0 44
2 23448 2.1091 284.4144 0019077 356.6452 213.9930 1.00118093 08
1994087B
1 23449U 94087B 94364.18646991 .02539263 12304-4 28310-3 0 105
2 23449 51.6527 269.3675 0003727 297.3602 66.8611 16.36319339 288
1994087C
1 23450U 94363.17094068 -.00003972 12559-4 00000+0 0 60
2 23450 51.6047 275.0634 0009419 205.6738 306.8025 16.45894874 112
1994082F
1 23452U 94082F 94362.83565815 .00000900 00000-0 82334-3 0 32
2 23452 47.3178 270.7231 7263969 3.3046 359.6305 2.27981277 307
1994088A
1 23453U 94088A 94364.28112269 .00191227 22432-4 29836-3 0 73
2 23453 64.9066 303.1277 0043204 83.1599 283.0896 16.01945076 129
1994088B
1 23454U 94088B 94364.21540018 .01346951 72897-5 47650-3 0 54
2 23454 64.9129 303.3821 0065320 67.3905 293.4168 16.19043648 114
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Dr TS Kelso Adjunct Professor of Space Operations
tkelso@afit.af.mil Air Force Institute of Technology
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2237. Re: re GOES TAP move to Ku band

Newsgroup: rec.radio.amateur.space
Date: 1994-12-30 23:04:49 UTC
From: Kevin Shea <mashea@students.wisc.edu>
Message-ID: <3e23mh$eer@news.doit.wisc.edu>
Source record: 26141

ken@sislnews.csc.ti.com (Ken Durham) wrote:
>
> Kevin
>
> Your posting did not include your name for a return address, so I'll
> ask my question here.

Sorry, I'm using Netscape's Mosaic browser to read USENET (I usually read it off the UW's VAX and that does the name and signature automatically.

> The information may be useful to others also. Do
> you know which Ku band Satellite and transponder is to be used for the
> GOES TAP service? Also, what is FM3 and is it possible to detect and decode
> it for the weather pictures?

The FM3 is a coded digital compression signal as I understand it. Alden needed more thruput and went to this new system. I believe the satellite is Galaxy 4 Ku.

Thanks to you and Ned for the answers you posted. I was beginning to think
> I was listening to the wrong Satellite since there was NO detectable signal
> near 1.9Mhz on S3 tr17 baseband .....no quieting ....nothing.
>
> Ken K5MBV drham@lobby.ti.com

73,
Kevin N9JKP
shea4460@macc.wisc.edu

2238. WANTED: Multimode TNC

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 04:49:00 UTC
From: darryl.linkow@grinder.org
Message-ID: <8A0A4E1.01A100021E.uuout@grinder.org>
Source record: 26142

N3MCX,

I tried leaving you Email at the address below, but the message got
kicked out. Something about not finding a user "TR1610" on
delphi.com. At any rate, here is the body of the message. Get
back to me via Email and please leave me a mailbox address that
will work!

To: TR1610@delphi.com

Subject: Re: WANTED: Multimode TNC
From: darryl.linkow@grinder.org (DARRYL LINKOW)

TR>Darryl,

TR>The software is "PC-PAKRATT for Windows" version 2.0. The everything else
TR>simply meant cables, manual, etc. Let me know.

Sorry, but I do a lot of messaging on Internet Email, and do not
remember what exactly what it is that you are selling! It
helps if you quote part of the previous message when replying to
someone on these nets. That being the case, would you be so kind
as to reply with the full description of the package that you are
selling? I am very interested in getting PC-PAKRATT for Windows
2.0 from you. Just let me know the what the rest is and I'm sure
we can work a deal.
73 de KE6IHA - Darryl

Email: darryl.linkow@ledge.com
OR
darryl.linkow@grinder.org
---
* OLX 2.2 * Darryl Linkow (818)346-5278 9 am - 5 pm PST

2239. Re: re GOES TAP move to Ku band

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 08:24:24 UTC
From: stearns@aztec.inre.asu.edu
Message-ID: <3e34fo$fc3@news.asu.edu>
Source record: 26143

Ken,

I am here to say that GOES TAP is still operational on C band. There used to
be three channels of weather images; one focussed on thee western US, one on
the eastern US and one running METEOSAT 3 and METEOSAT 4 (or 5) alternately.
Some months back, the METEOSAT channel went quiet. They have been switching
the sources of the images from GOES 7 to GOES 8, lately. Images are quitnice and worth the
te nice
and are worth the effort to capture. I hope they don't abandon the C banddistribution for a
whi
distribution for a while.

Ned

2240. ARLK057 Keplerian data

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 17:29:27 UTC
From: w1aw@arrl.org
Message-ID: <$arlk057.1994@ampr.org>
Source record: 26145
Cross-posted to: rec.radio.info,rec.radio.amateur.space

```
SB KEP @ ARL $ARLK057
ARLK057 Keplerian data

ZCZC SK25
QST de W1AW
Keplerian Bulletin 57 ARLK057
From ARRL Headquarters
Newington, CT December 31, 1994
To all radio amateurs

SB KEP ARL ARLK057
ARLK057 Keplerian data

Thanks to NASA, AMSAT and N3FKV for the following Keplerian data.

Decode 2-line elsets with the following key:
1 AAAAAU 00 0 0 BBBBB.BBBBBBBB .CCCCCCCC 00000-0 00000-0 0 DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

STS-63
1 99963U 95999A 95033.30211252 .00136628 00000-0 40709-3 0 16
2 99963 51.6699 114.9867 0040902 359.8331 0.2628 15.95289378 24
AO-10
1 14129U 83058B 94362.30354351 -.00000400 00000-0 10000-3 0 3330
2 14129 26.6502 290.8469 6024517 239.2864 48.4317 2.05884111 58816
RS-10/11
1 18129U 87054A 94363.53916398 .00000027 00000-0 13106-4 0 12
2 18129 82.9233 184.4505 0010824 196.6152 163.4642 13.72346431376705
UO-11
1 14781U 84021B 94362.05077029 .00000121 00000-0 28260-4 0 7635
2 14781 97.7808 7.6562 0012487 14.5055 345.6503 14.69288118578778
RS-12/13
1 21089U 91007A 94362.08106916 .00000046 00000-0 33102-4 0 7645
2 21089 82.9220 227.6513 0028164 291.2297 68.5843 13.74052236195275
AO-13
1 19216U 88051B 94359.45521171 .00000299 00000-0 10000-4 0 27
2 19216 57.6425 212.9941 7252695 357.9387 0.3797 2.09718713 18526
UO-14
1 20437U 90005B 94360.24202022 .00000025 00000-0 26635-4 0 620
2 20437 98.5815 82.3189 0011391 351.8601 8.2386 14.29869250257034
RS-15
1 23439U 94085A 94362.60621975 -.00000042 00000-0 00000+0 0 107
2 23439 64.7982 170.9390 0224393 305.3126 52.6969 11.19236697 283
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RS-15?
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2 23440 64.8297 172.1572 0188748 292.0126 66.1014 11.27113018 197
AO-16
1 20439U 90005D 94364.20885962 .00000005 00000-0 18802-4 0 8614
2 20439 98.5910 87.6821 0011586 341.1391 18.9362 14.29923549257615
DO-17
1 20440U 90005E 94360.22588266 .00000034 00000-0 29954-4 0 8613
2 20440 98.5910 84.1439 0011736 351.7149 8.3841 14.30063909257060
WO-18
1 20441U 90005F 94364.19293213 .00000013 00000-0 21928-4 0 8653
2 20441 98.5901 88.0448 0012227 340.5210 19.5507 14.30036727257639
LO-19
1 20442U 90005G 94360.72952977 .00000025 00000-0 26589-4 0 8604
2 20442 98.5931 84.9366 0012688 349.6811 10.4102 14.30135799257152
FO-20
1 20480U 90013C 94364.22091868 -.00000011 00000-0 56365-4 0 7584
2 20480 99.0619 119.2779 0539750 255.6286 98.4327 12.83229177229276
AO-21
1 21087U 91006A 94361.00590256 .00000093 00000-0 82657-4 0 5512
2 21087 82.9394 0.0073 0034144 267.9634 91.7610 13.74549524196079
UO-22
1 21575U 91050B 94364.15223932 .00000048 00000-0 30641-4 0 5679
2 21575 98.4133 74.4924 0008654 65.2551 294.9534 14.36952043181224
KO-23
1 22077U 92052B 94364.09429761 -.00000037 00000-0 10000-3 0 4608
2 22077 66.0779 229.8002 0013913 241.2790 118.6829 12.86289982111980
KO-25
1 22828U 93061F 94364.19788759 -.00000008 00000-0 14625-4 0 3367
2 22828 98.6330 77.9519 0010360 348.0472 12.0465 14.28081413 33757
KO-25?
1 22830U 93061H 94361.18607604 .00000042 00000-0 34202-4 0 3657
2 22830 98.5369 70.1242 0011558 334.9907 25.0715 14.28078699 65249
IO-26
1 22826U 93061D 94360.23799017 .00000025 00000-0 28081-4 0 3566
2 22826 98.6374 74.0142 0009759 14.0258 346.1189 14.27752933 65092
AO-27
1 22825U 93061C 94364.19588153 -.00000002 00000-0 17069-4 0 3594
2 22825 98.6366 77.8557 0008724 2.5345 357.5880 14.27646793 65655
PO-28
1 22829U 93061G 94360.21319314 .00000028 00000-0 28846-4 0 3501
2 22829 98.6341 74.0370 0010561 359.9147 0.2026 14.28057393 65102
Mir
1 16609U 86017A 94364.24611840 .00003865 00000-0 56300-4 0 8782
2 16609 51.6491 284.5863 0001987 102.3474 257.7740 15.58409123506575

Keplerian bulletins are transmitted twice weekly from W1AW.
The next scheduled transmission of these data will be Tuesday,
January 3, 1995, at 2330z on Baudot and AMTOR.
NNNN
```

/EX

2241. Info wanted

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 17:50:14 UTC
From: Steve Kittelsen <sak1@delphi.com>
Message-ID: <h0x7gAm.sak1@delphi.com>
Source record: 26144

I just discovered this news group, and I'm looking for frequencies to Oscar 20
and above.
I also wamted to know if the telemetry signal from Oscar 17 (Dove) is weaker
than it used to be a year ago or so. I have real problems getting a good
copy of the telemetry data from the satellite on a vertical omni.
Thanks

```
**********************************************************************
* __/\__/\ Steve Kittelsen __________ *
* / /\ \ Rochester, New York \ / *
* I I I I " sak1@delphi.com " \ / *
* \ __\/__ / Open Your Mind \/ *
**********************************************************************
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2242. RS-15 Anyone Worked It??

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 19:02:10 UTC
From: BRUCE268@news.delphi.com
Message-ID: <3e49ri$6ch@news2.delphi.com>
Source record: 26146

Has anyone heard/worked the new RS-15 bird? I have listened several times and never heard anything, except when RS-10 was also in range. Which leads to my next question: What are they going to do when both birds are over the same area at the same time on almost the same passband?? There also seems to be some questions as to the validity of the keps avalable to date. I have downloaded keps from at least three different sorces and they all put the bird at the same location, but are they correct? Any responces would be appreciated. Good luck to all you RS-15 seakers.
73, Bruce WA4JAV.

2243. PSK modem

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 20:33:18 UTC
From: Steve Kittelsen <sak1@delphi.com>
Message-ID: <p+0boem.sak1@delphi.com>
Source record: 26147

I'm currently receiving packet from Dove without a TNC, just the BayCom interface is used.
Now, if I want to receive telemetry from other sats using 1200 or 9600 bps PSK modulation, I need a PSK demodulator or modem. I'm getting a downconveter from 435 MHz to 10meter, and using my digital shortwave with SSB, I should get a signal. Is this signal a phase modulated signal that can be feed to a phase demodulator, then converted to a FSK signal and use the current packet modem on my PC? Or are there PSK modems that connects directly to the serial port? I'm trying to make it cheap, without a TNC and fancy equipment.

Any comment is helpful.

****
* __/__/\ Steve Kittelsen _____ *
* / /\ \ Rochester, New York \ / *
* I I I I " sak1@delphi.com " \ / *
* \ __\/__ / Open Your Mind \/ *
****

2244. Re: Ham-Space Digest V94 #368

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 20:42:10 UTC
From: donw@marconi.w8upd.uakron.EDU
Message-ID: <9412312042.AA05835@marconi.w8upd.uakron.edu>
Source record: 26148

[No readable article body recovered]

2245. GOES-TAP

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 21:14:53 UTC
From: Kevin Shea <mashea@students.wisc.edu>
Message-ID: <3e4hkd$mtj@news.doit.wisc.edu>
Source record: 26149

Ken,

Ned is right about it still being on. When I checked for it the other day I had my coax hooked to the wrong output.

Alden is in the process of switching its customers to Ku and like everthing else they've probably fallen behind schedule.

73,
Kevin

2246. Re: PSK modem

Newsgroup: rec.radio.amateur.space
Date: 1994-12-31 22:10:47 UTC
From: Robert D Houghton <rhought@cello.gina.calstate.edu>
Message-ID: <3e4kt8$jtt@cello.gina.calstate.edu>
Source record: 26150

Steve,

To receive telemetry from the 1200 bps birds, you will need a PSK modem. As far as I know, they all need to attach the the "modem header" connector on a TNC. (So you will need a TNC). I've not heard of anyone building a "BayComlike" psk modem that works with the BayCom software, although I imagine that this could be done.

The 9600 bps sats transmit FSK FM (the same as terrestrial 9600 packet). To receive this telemetry you will need a 9600 bps TNC and you will most likely need to connect directly to the the discriminator on the FM board of your 10 meter radio. (Wide frequency response needed for 9600 bps signals.)

I would be interested in knowing which 435 to 28 Mhz converter you are going to buy. I am planning to get on the pacsats the same way. I have a nice satellite station at school (Yaesu Ft-736R, AEA 1232, KLM crossed az-el yagis) but I want to set up at home without spending too much money. The only downconverter that I have seen advertized is the Hamtronics unit. Are there others?

Take care,

Bob
Robert D. Houghton
Science Department Chairman
John A. Rowland High School
Rowland Heights, CA 91748
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kc6lvg@amsat.org